1/178

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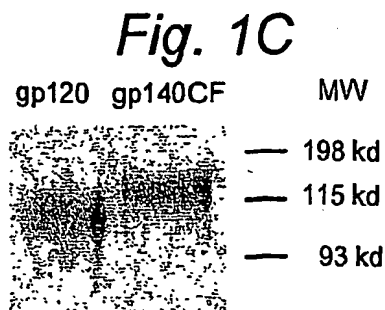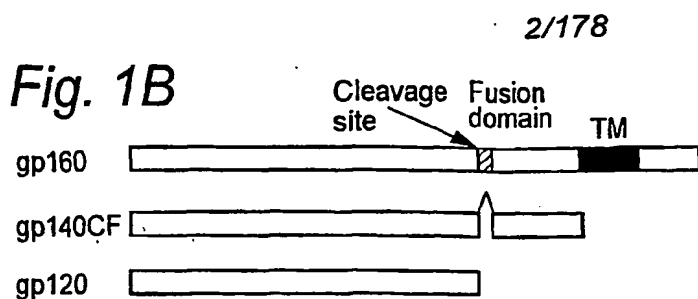
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Fig. 1A

Fig. 1B

Cleavage Fusion
site   domain   TM

gp160

gp140CF

gp120

Fig. 1C

gp120 gp140CF   MW
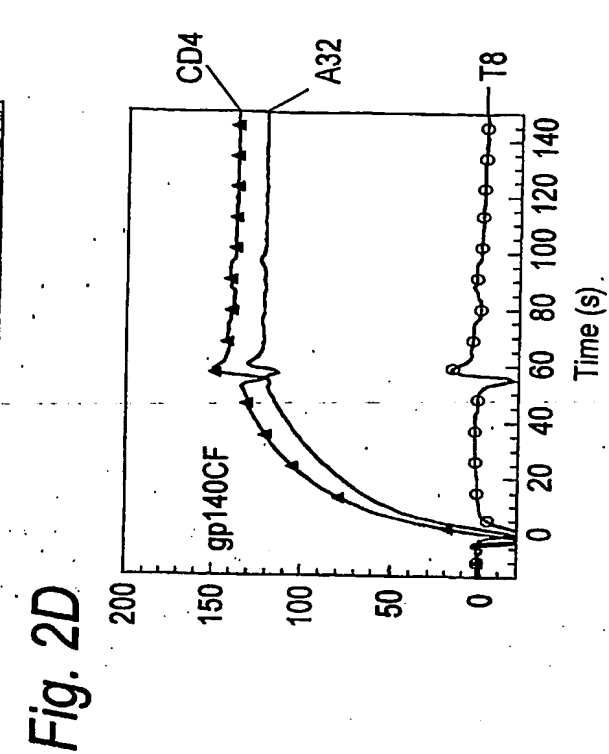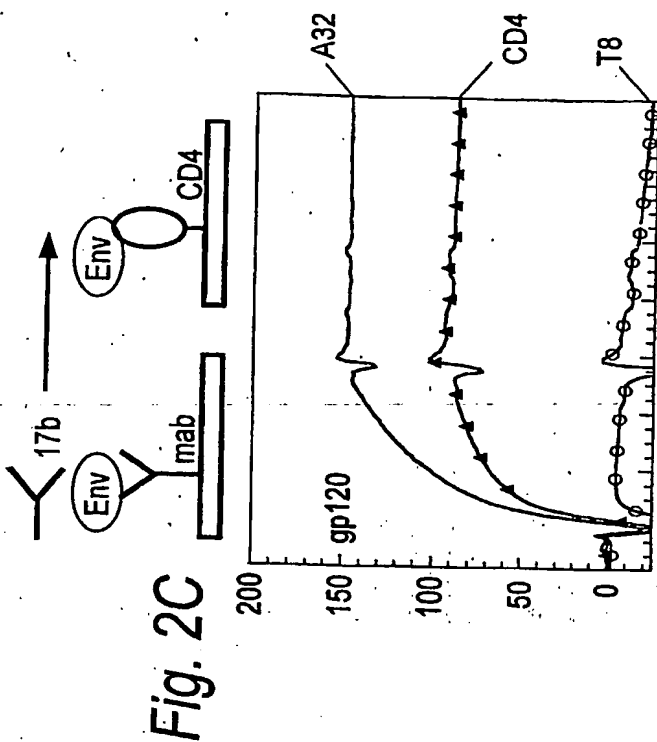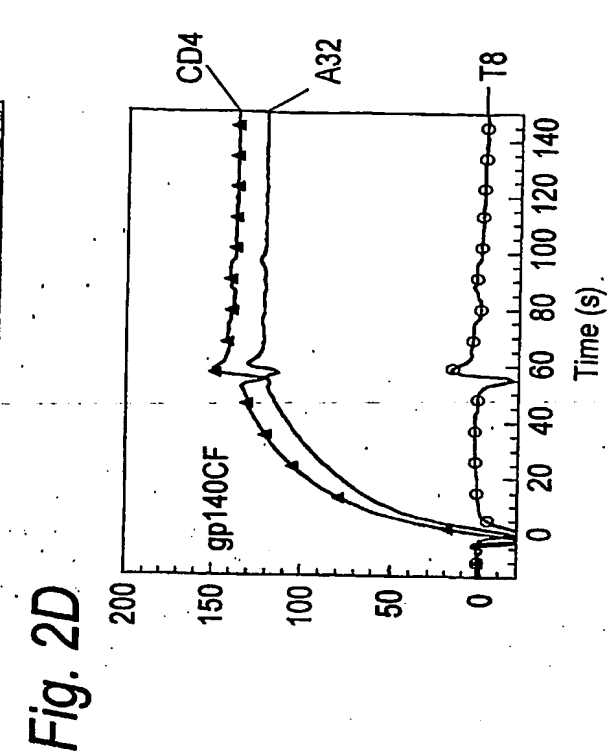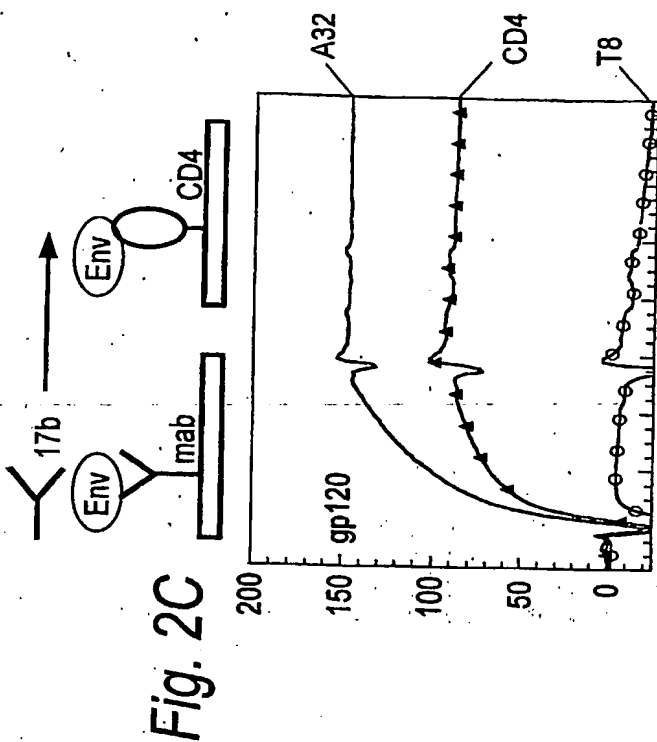
— 198 kd
— 115 kd
— 93 kd

Fig. 1D

CON6.env (group M env consensus. This one contain five variable regions in env gene
from 98CN006 virus, not in the public domain yet)

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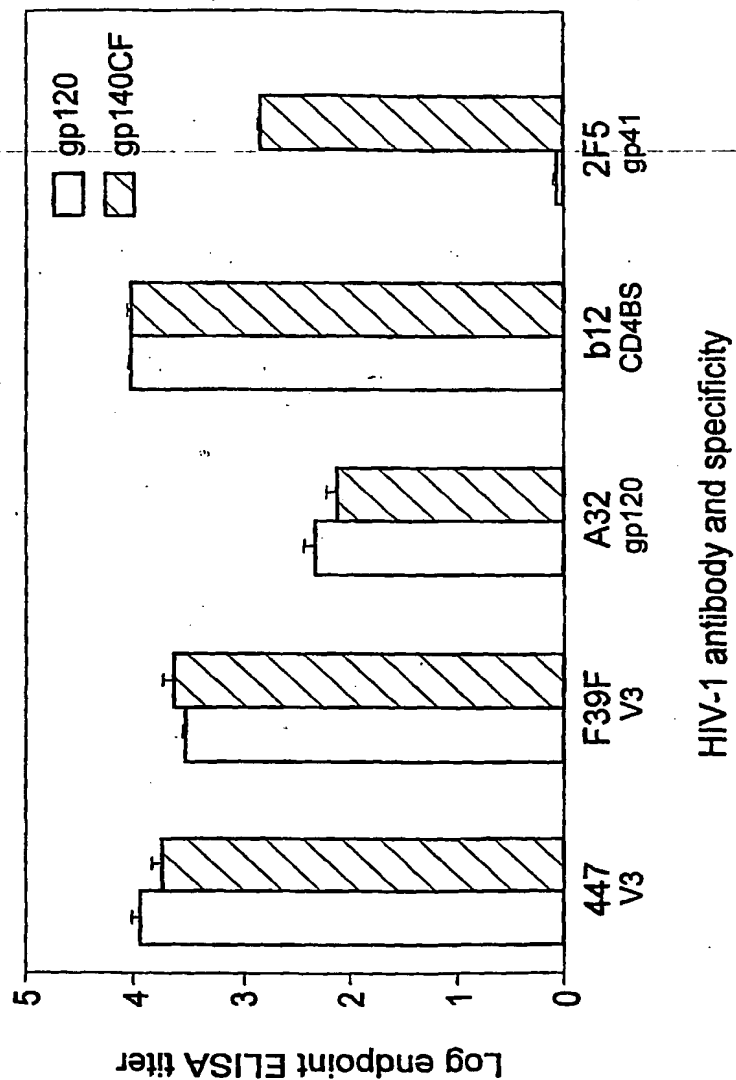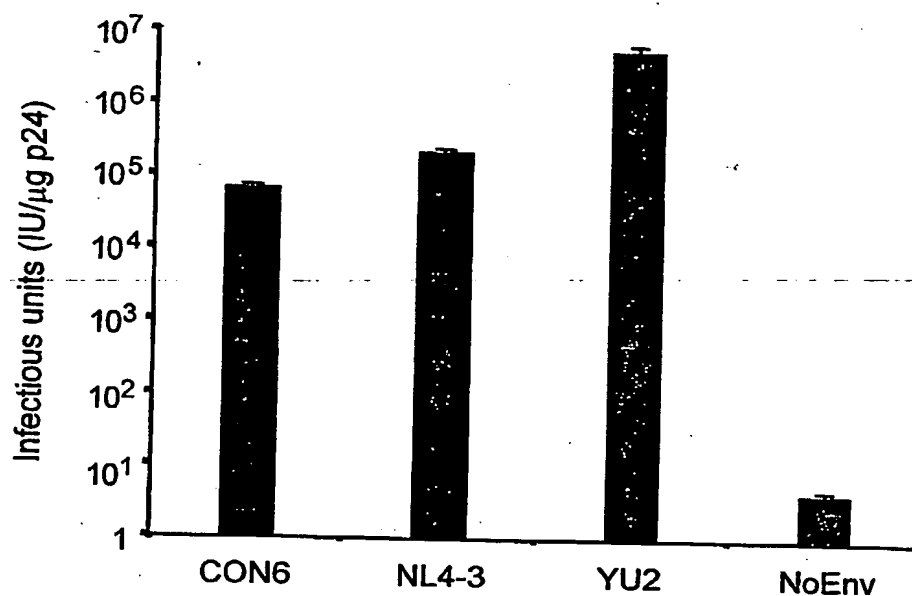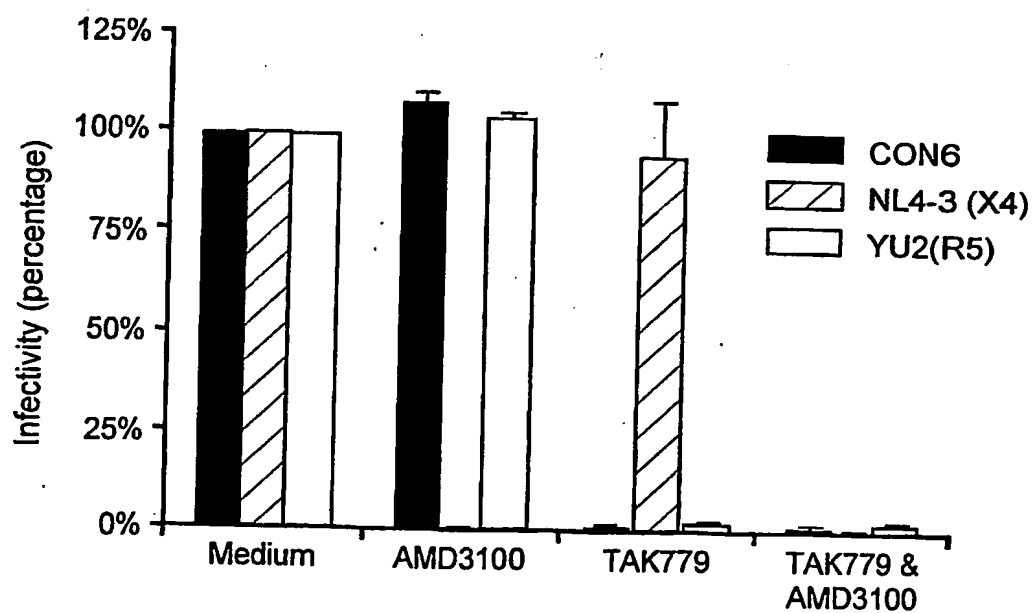
Fig. 2A

Fig. 2B

Fig. 2C

Fig. 2D

Fig. 2E

Fig. 3A

Fig. 3B

Fig. 4

Fig. 5

Fig. 6A

C.anc.env (subtype C ancestral env. The amino acid sequence is different from Los Alamos Database August 2002)

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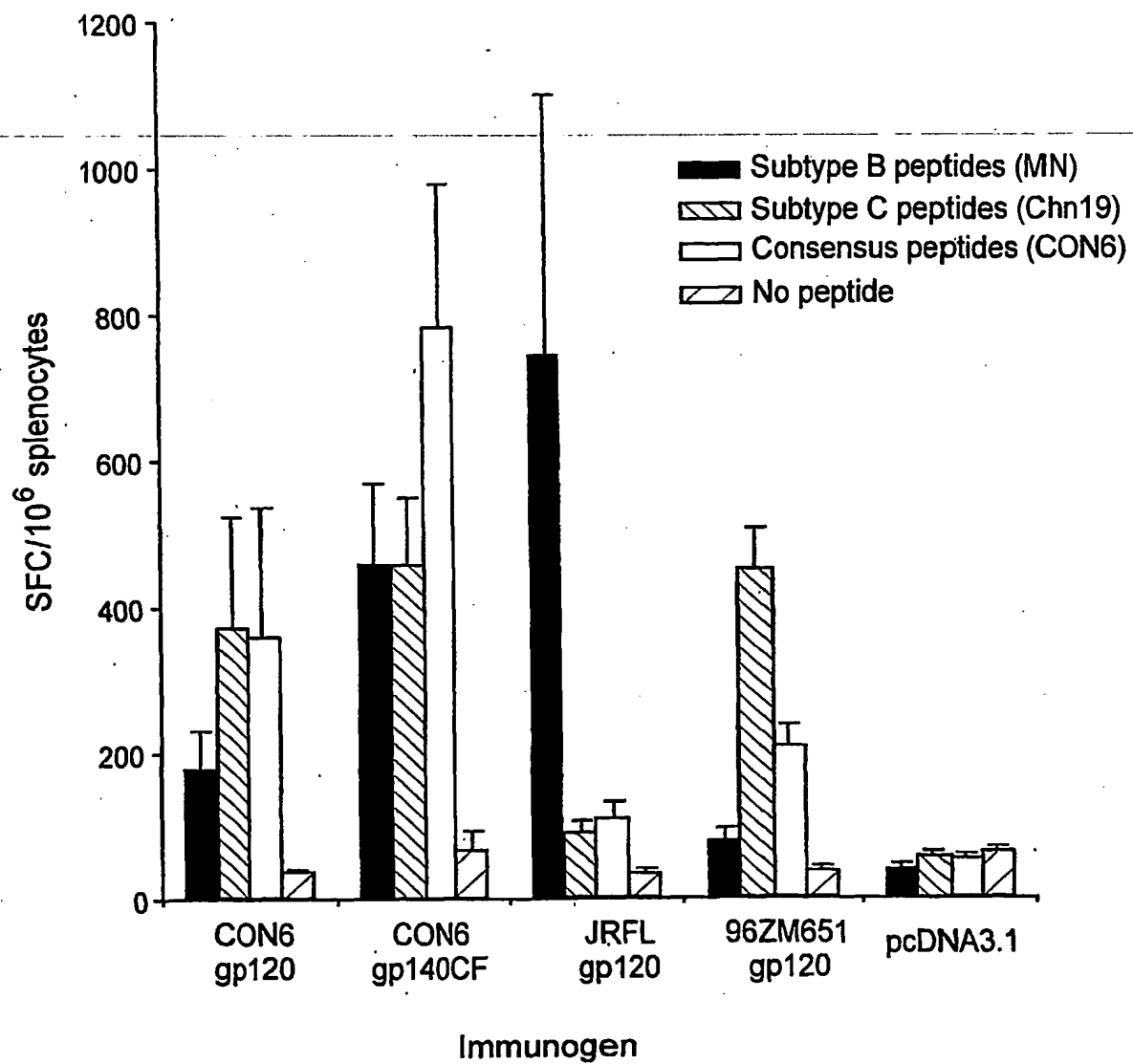
Fig. 6B

C.con.env (subtype C consensus env. The amino acid sequence is different from Los Alamos Database August 2002)

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Fig. 6C

C.con.env (subtype C consensus env)

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Fig. 6D
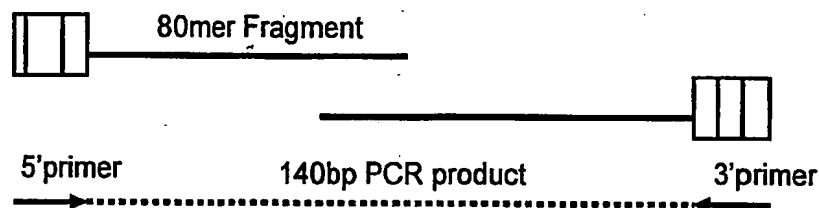
Fig. 6E

Synthesize entire gene in 80-mer fragments overlapping by 20 residues
at the 3' end with invariant sequences at the 5' end.
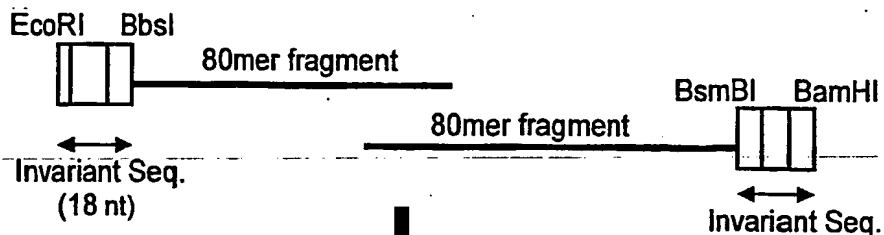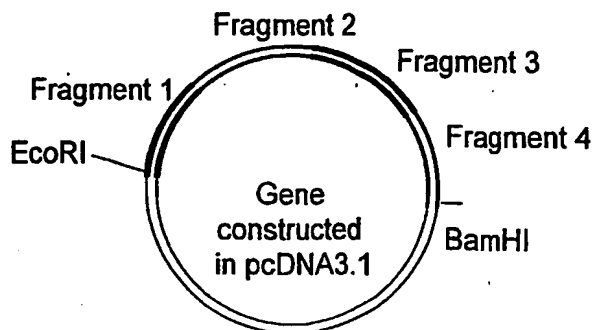

Paired 80mer oligos are connected via PCR in a stepwise manner from 5' to 3' using
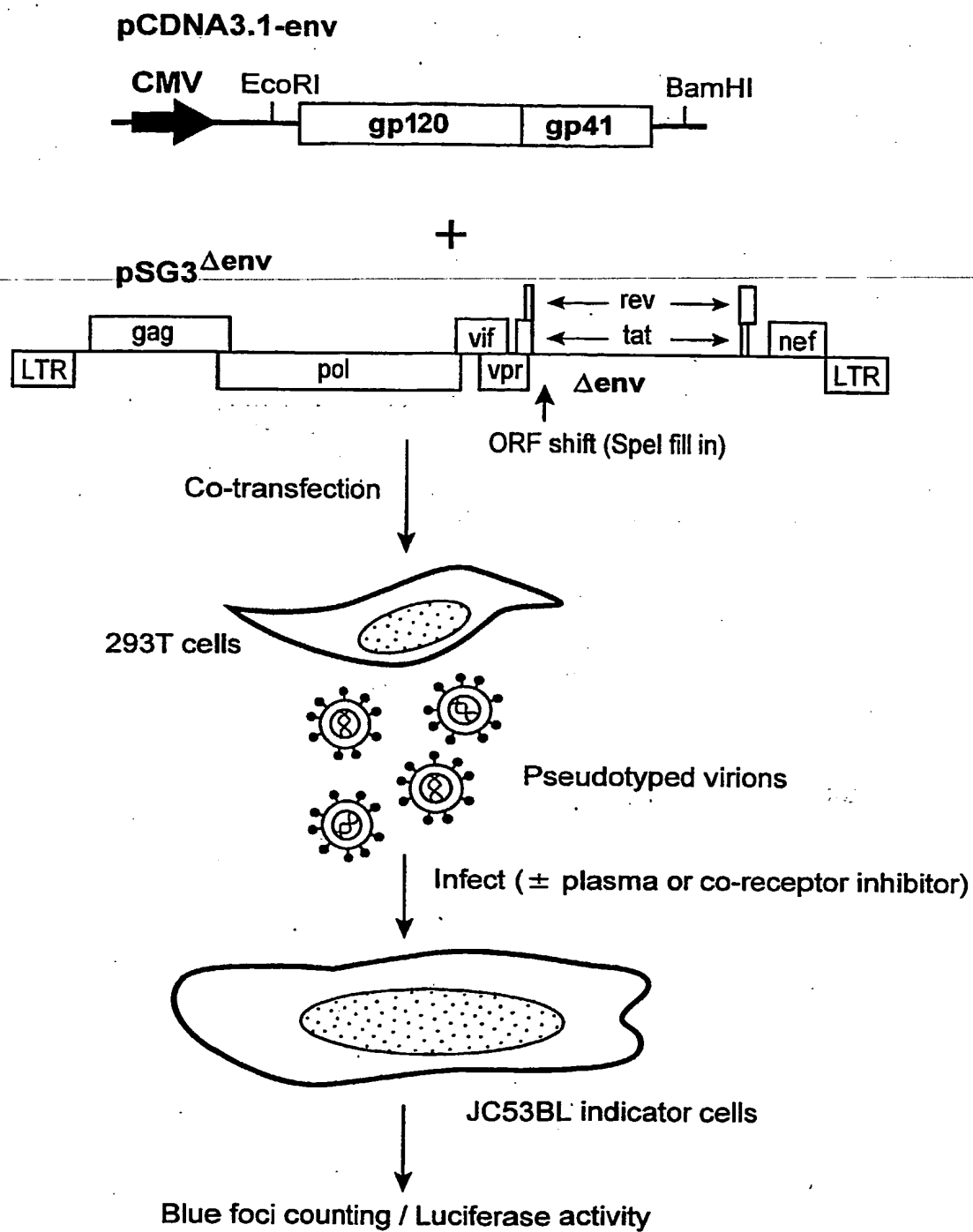primers complimentary to the invariant seq.

108bp PCR fragments cloned into pGEM-T and sequenced. Clones with the proper sequence
will be cut with 2 restriction enzymes. 4 fragments will be ligated together with pcDNA3.1 in
a stepwise manner from the 5' to 3' end of gene

Fragments to be ligated with pcDNA3.1 (1- 4 are in order from 5' to 3')	Restriction Enzymes Used to Cleave Fragment
Fragment 1	EcoRI/BsmBI
Fragment 2	Bbsl/BsmBI
Fragment 3	Bbsl/BsmBI
Fragment 4	Bbsl/BamHI
pcDNA3.1	EcoRI/BamHI

Ligations will be repeated stepwise 5' to 3' until the entire gene
has been cloned into pcDNA3.1

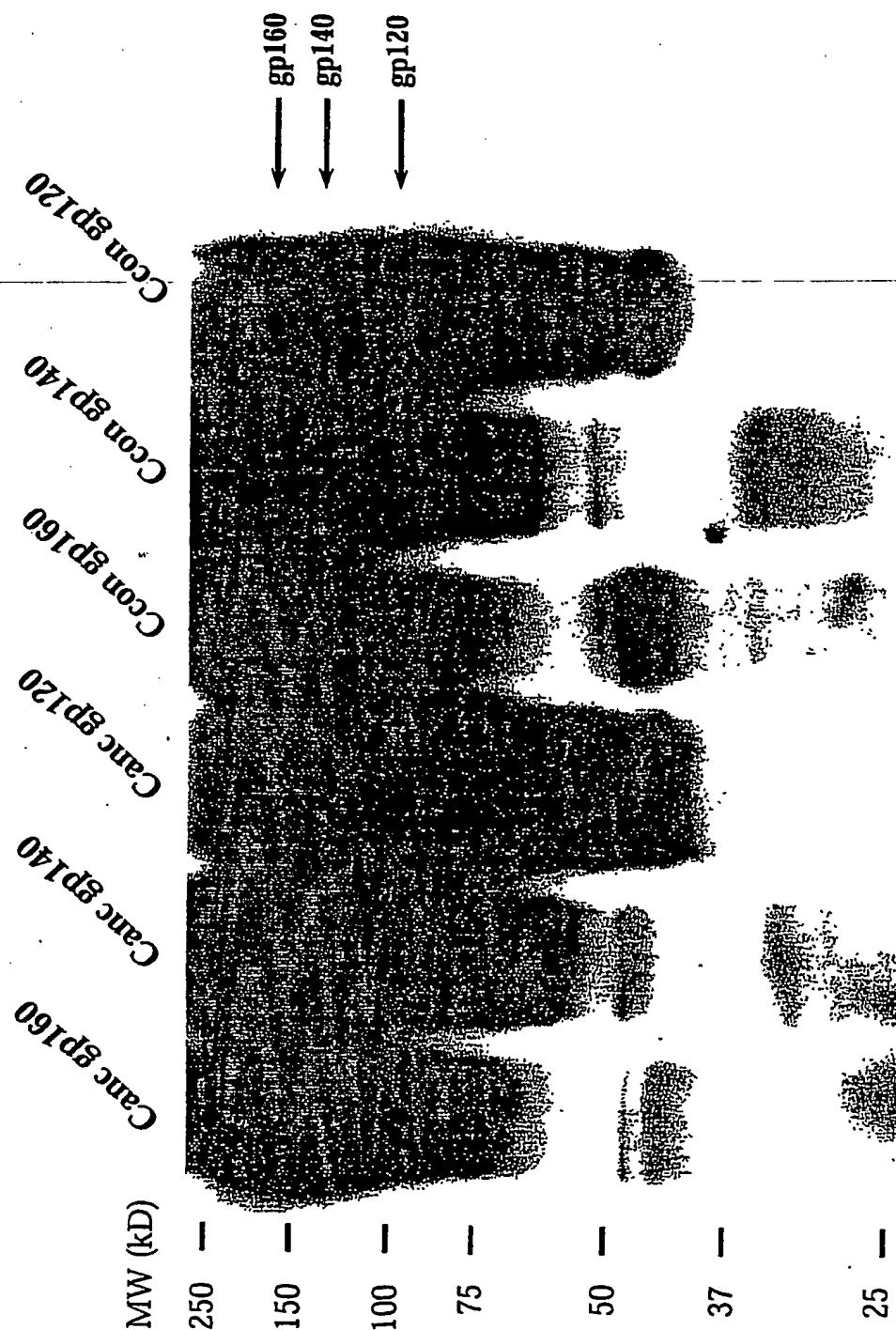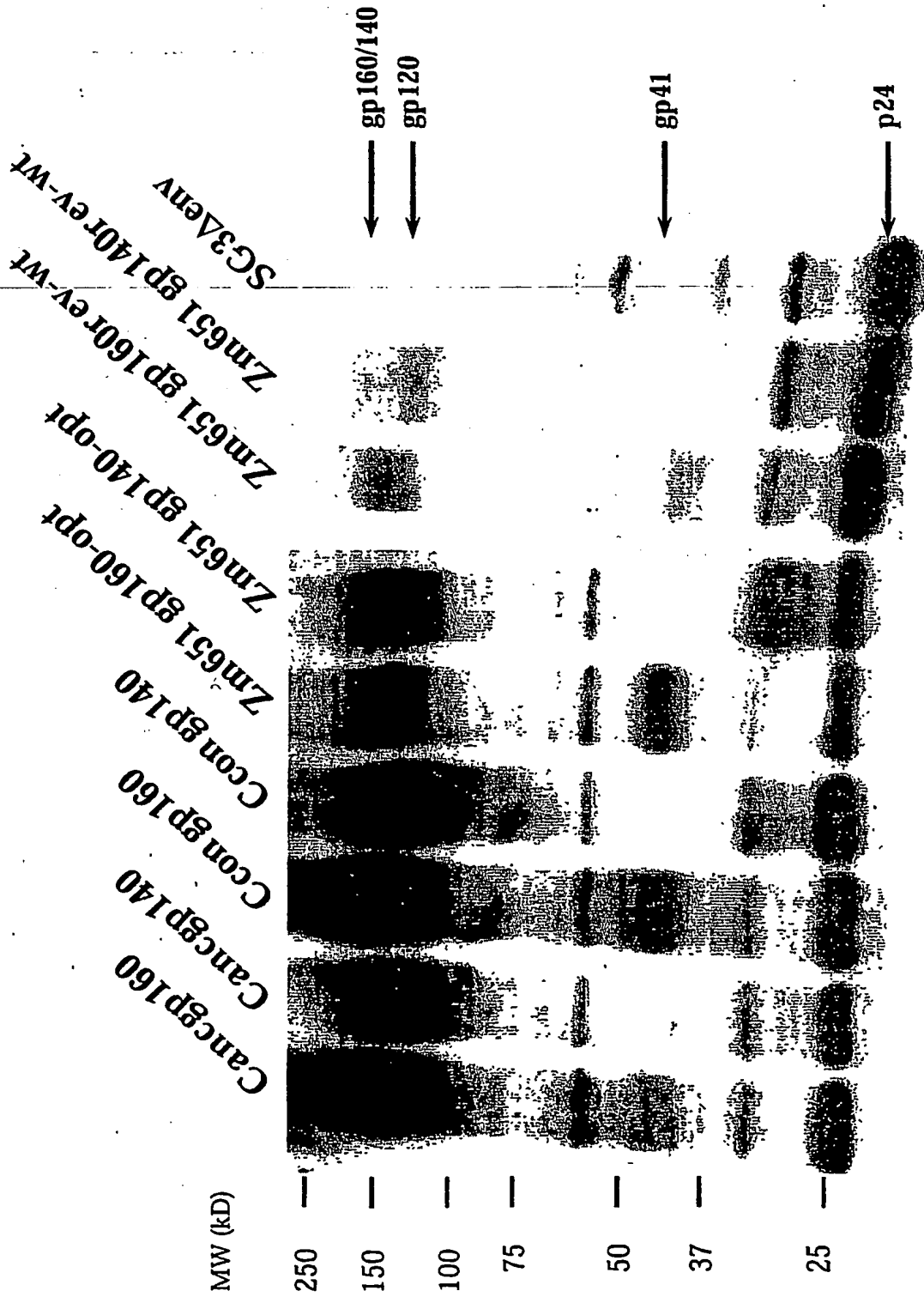**SUBSTITUTE SHEET (RULE 26)**

pCDNA3.1-env

CMV   EcoRI   BamHI
▶▶▶ | | gp120 | gp41 | |

$+$

pSG3$^{\Delta env}$

|LTR| | gag | | pol | |vif| | | ⟵ rev ⟶ | | |nef| |LTR|
                              |vpr| ⟵ tat ⟶
                                    Δenv
                              ↑
                         ORF shift (SpeI fill in)

↓

Co-transfection

293T cells

Pseudotyped virions

Infect (± plasma or co-receptor inhibitor)

↓

JC53BL indicator cells

↓

Blue foci counting / Luciferase activity

Fig. 7

Fig. 8

```
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      V4                                      V5
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                                                                                              gp120 ↑ gp41
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                                                        gp140 ↑
EDSQNQQEKNEKDLLALDSWKNLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEEGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRL
EESQNQQEKNEQDLLALDSWENLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLERIEEEGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRL

LDFILVAARAVELLGRSSLRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQGFEAALQ 843
LDFILIAARTVELLGRSSLRGLQRGWEALKYLGSLVQYWGQELKKSAISLLDTIAIAVAEGTDRIIEVVQRACRAILNIPRRIRQGFEAALL 843
```

Fig. 9

Fig. 10A

Fig. 10B

Fig. 11

Fig. 12A

Fig. 12B

Fig. 12C

Fig. 13A

Gag

p55
p24

Cell lysate Supernatant

96ZM651
Consensus C
Mock
96ZM651
Consensus C
Mock

Fig. 13B

Nef

p33
p22

Cell lysate Supernatant
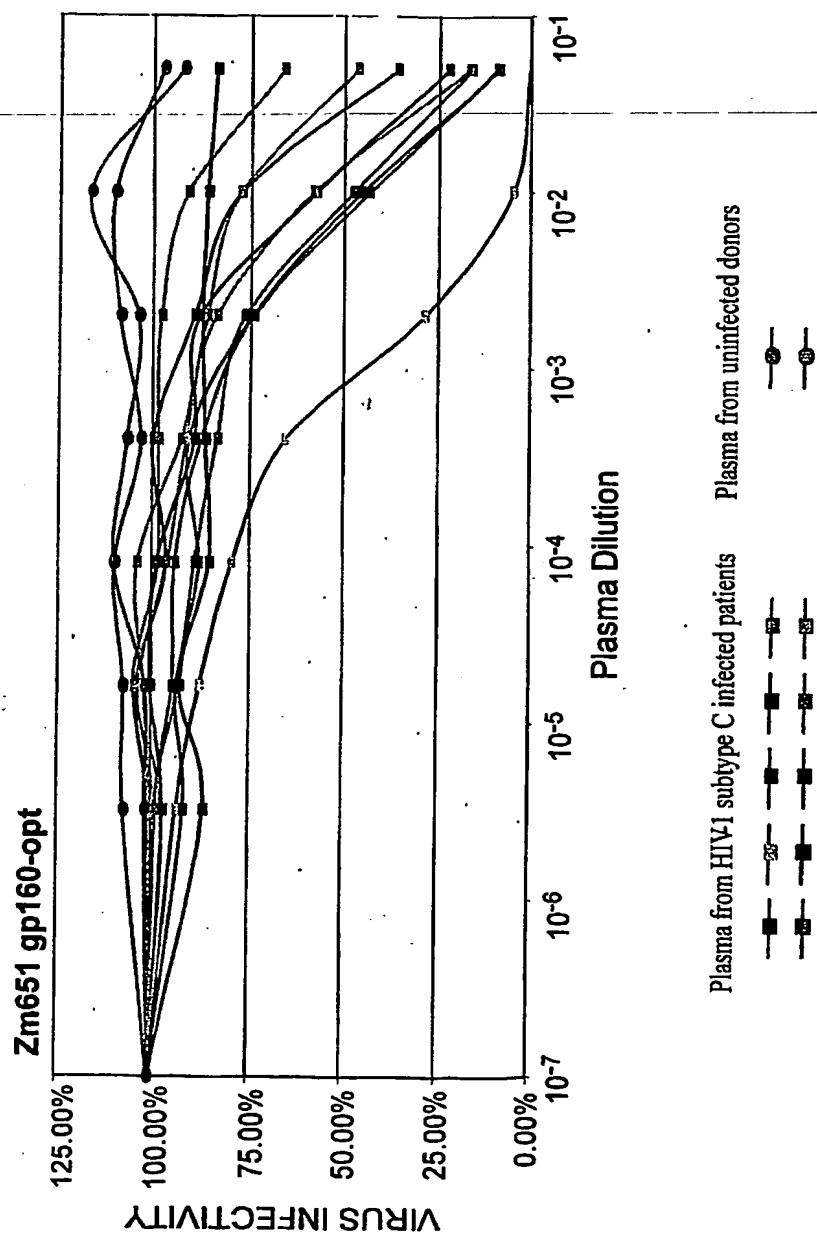
96ZM651
Consensus C
Mock
96ZM651
Consensus C
Mock

Fig. 13C

C.con.gag (subtype C con sensus gag)

MGARASILRGGKLDTWEKIRLRPGGKKRYMIKHLVWASRELERFALNPGLLETSEGCKQIMKQLQPA
LQTGTEELRSLYNTVATLYCVHEKIEVRDTKEALDKIEEEQNKSQQKTQQAEAAADGKVSQNYPI
VQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDT
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPVPVGDIYKRWIILGLNKIV
RMYSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGASLE
EMMTACQGVGGPSHKARVLAEAMSQANNTNIMMQRSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCWK
CGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAESFRFEETTPA
PKQEPKDREPLTSLKSLFGSDPLSQ

Fig. 13D

C.con.nef (subtype C consensus nef)

MGGKWSKSSIVGWPAVRERIRRTEPAAEGVGAASQDLDKYGALTSSNTATNNADCAWLEAQEEEEV
GFPVRPQVPLRPMTYKAAFDLSFFLKEKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGVRYP
LTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKWKFDSHLARRHMARELHPEYYKDC

C.con.gag (subtype C consensus gag. Not in the public domain)

GCCGCCGCCATGGGCGCCCCGCGCGCGCCGGCGGCCAGCATCCTCTGCGGCGGCGGCCAAGCTTGGACACCTGGACAGGAAGATCCGCC
TGCGCCCCGGCGGCCAAGAAGCGCTACATGATCAAGCACCTGGTGTGGGCCAGCCGCGAGCTGGAGCGCTT
CGCCCTGAACCCCGGCCTGCTGGAGACCAGCGAGGGCTGCAAGCAGATCATGAAGCAGCTGCAGCCCGCC
CTGCAGACCGGCACCGAGGAGCTGCGCAGCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGA
AGATCGAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGAGCCAGCAGAA
GACCCAGCAGGCCAAGGCCGCCGCCGACGGCAAGGTGAGCCAGAACTACCCCATCGTGCAGAACCTGCAG
GGCCAGATGGTGCACCAGGCCATCAGCCCCCGCACCCTGAACGCCTGGGTGAAGGTGATCGAGGAGAAGG
CCTTCAGCCCCGAGGTGATCCCCATGTTCACCGCCCTGAGCGAGGGCGCCACCCCCCAGGACCTGAACAC
CATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCC
GCCGAGTGGGACCGCCTGCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCG
GCAGCGACATCGCCGGCACCACCAGCACCCTGCAGGAGCAGATCGCCTGGATGACCAGCAACCCCCCCGT
GCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACAGCCCC
GTGAGCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGA
CCCTGCGCGCCGAGCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGC
CAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGTGCTGCCCAGCCTGGAGGAGATGATGACCGCC
TGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGAGCCAGGCCAACAACA
CCAACATCATGATGCAGCGCAGCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAA
GGAGGGCCACATCGCCCGCAACTGCCGCGCCCCGCAGCGGCCAACTTCCTGGGCAAGATCTGGCCCAGCCACAAGGGCC
CACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGGGCAAGATCTGGCCCAGCCACAAGGGCC
GCCCCGGCAACTTCCTGCAGAGCCGCCCCGAGCCCACCGCCCCCCCGAGGAGTCCTTCCGCTTCGAGGA
GACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCAGCCTGAAGAGCCTGTTCGGC
AGCGACCCCCTGAGCCAGTAA

Fig. 13E

C.con.nef (subtype C consensus nef. Not in the public domain)

GCCGCCGCCATGGGCGGCAAGTGGAGCAAGAGCAGCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCC
GCCGCACCGAGCCCGCCGCCGAGGCCGTGGGCGCCGCCAGCCAGGACCTGGACAAGTACGGCGCCCTGAC
CAGCAGCAACACCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGGAGGAGGAGGAGGTG
GGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGAGCTTCT
TCCTGAAGGAGAAGGGCGGCCTTCTTCCCCGACTGGCAGAACTACACCCCCGGCCCCGGCGTGCGCTACCCC
GGTGTACCACACCCCAGGGCTTCTTCCCCGACTGGCAGAACTACACCCCCGGCCCCGGCGTGCGCTACCCC
CTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGAGAAGGTGGAGGAGGCCAACGAGGGCG
AGAACAACTGCCTGCTGCACCCCATGAGCCAGCACGGCATGGAGGACGAGCACCGCGAGGTGCTGAAGTG
GAAGTTCGACAGCAGCCTGGCCTTCCACCACAGGGCCCGCCAGCTGCACCCCGAGTACTACAAGGACTGC
TGA

Fig. 13F

CONs.env (gorup M consensus env gene. This one contain the consensus sequence for variable regions in env gene)

MRVRGIQRNCQHLWRWGTLILGMLMICSAAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNV
WATHACVPTDPNPQEIVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNVNVTN
TNNTEEKGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPIDDNNNNSSNYRLINCNTSAITQACPKVSF
EPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENITNN
AKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISGTKWNKTLQQVAKKLRE
HFNNKTIIFKPSSGGDLEITTHSFNCRGEFFYCNTSGLFNSTWIGNGTKNNNNTNDTITLPCRIKQIINM
WQGVGQAMYAPPIEGKITCKSNITGLLLTRDGGNNNTNETEIFRPGGGDMRDNWRSELYKYKVVKIEPLG
VAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHL
LQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTTVPWNSSWSNKSQDEIWDNMTWMEWEREI
NNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIV
NRVRQGYSPLSFQTLIPNPRGPDRPEGIEEEGGEQDRDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDFI
LIAARTVELLGRKGLRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRACRAIL
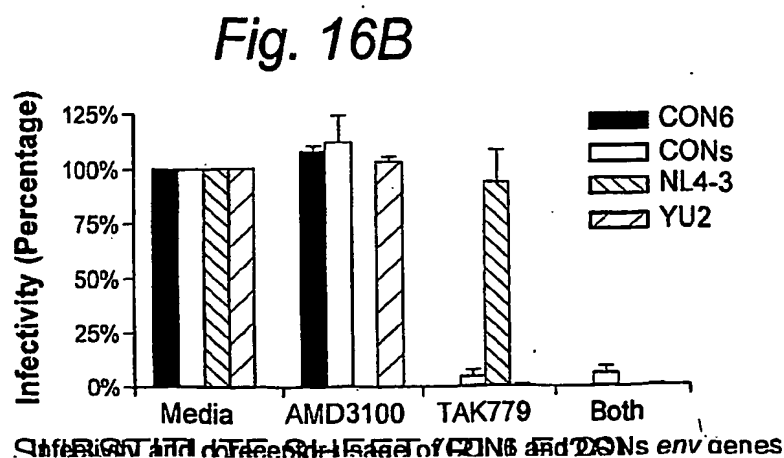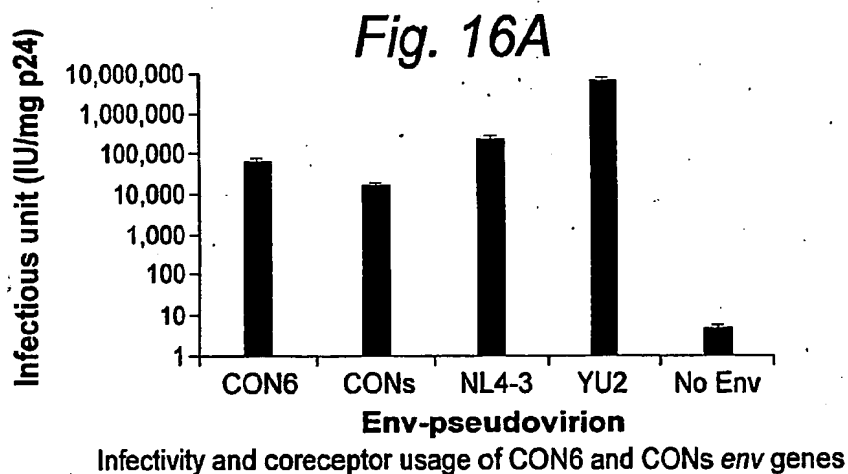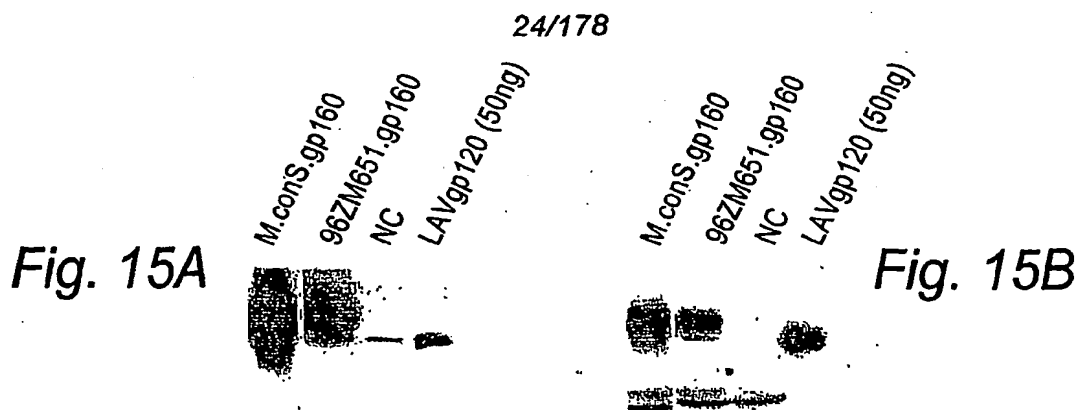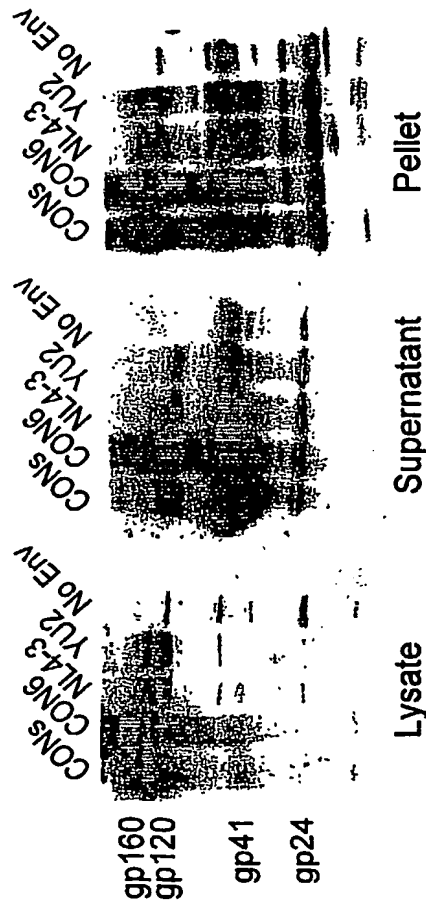NIPRRIRQGLERALL

Fig. 14A

Fig. 14C

Fig. 14B

CONs.env (gorup M consensus env gene. This one contain the consensus sequence for variable regions in env gene. The identical amino acid sequences as in the public domain)

```
GCCGCCGCCATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCCTGATCCTGGGCATGCTGATGATCTGCTCCGCCGCCG
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCC
AACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCC
AGGAGATCGTGCTGGAGAACGTGACCGAGAACTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGCA
CCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAG
ATCAAGAACTGCTCCTTCAACATCACCACCGAGATCCGCGACAAGAAGCA
GAAGGTGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCGACGACA
ACAACAACAACTCCTCCAACTACCGCCTGATCAACTGCAACACCTCCGCC
ATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTA
CTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCA
ACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGC
ATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGA
GGAGGAGATCATCATCCGCTCCGAGAACATCACCAACAACGCCAAGACCA
TCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAAC
AACAACACCCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTACGC
CACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCG
GCACCAAGTGGAACAAGACCCTGCAGCAGGTGGCCAAGAAGCTGCGCGAG
CACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGCGACCT
GGAGATCACCACCCACTCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCA
ACACCTCCGGCCTGTTCAACTCCACCTGGATCGGCAACGGCACCAAGAAC
AACAACAACACCAACGACACCATCACCCTGCCCTGCCGCATCAAGCAGAT
CATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCCATCG
AGGGCAAGATCACCTGCAAGTCCAACATCACCGGCCTGCTGCTGACCCGC
GACGGCGGCAACAACAACACCAACGAGACCGAGATCTTCCGCCCCGGCGG
CGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTGG
TGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGCCGCGTG
GTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCTT
CCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCCTGACCG
TGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCCAACCTG
CTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAGCTGACCGTGTGGGG
CATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGAAGG
ACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACC
ACCACCGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGGACGAGAT
CTGGGACAACATGACCTGGATGGAGTGGGAGCGCGAGATCAACAACTACA
CCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAG
AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACTG
GTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCG
TGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTG
AACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCTGATCCC
CAACCCCCGCGGCCCCGACCGCCCCGAGGGCATCGAGGAGGAGGGCGGCG
AGCAGGACCGCGACCGCTCCATCCGCCTGGTGAACGGCTTCCTGGCCCTG
GCCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCGCCTGCG
CGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCCGCAAGG
GCCTGCGCCGCGGCTGGGAGGCCCTGAAGTACCTGTGGAACCTGCTGCAG
TACTGGGGCCAGGAGCTGAAGAACTCCGCCATCTCCCTGCTGGACACCAC
CGCCATCGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGTGGTGCAGC
GCGCCTGCCGCGCCATCCTGAACATCCCCCGCCGCATCCGCCAGGGCCTG
GAGCGCGCCCTGCTGTAA
```

Fig. 15A M.conS.gp160 96ZM651.gp160 NC LAVgp120 (50ng)   *Fig. 15B* M.conS.gp160 96ZM651.gp160 NC LAVgp120 (50ng)

Cell lysate   **Supernatant**

Expression of A.con env gene in mammalian cells

Fig. 16A

Infectivity and coreceptor usage of CON6 and CONs *env* genes

Fig. 16B

Infection and coreceptor usage of CON6 and CONs *env* genes

gp160
gp120

gp41

gp24

CONs   CON6   NL43   YU2   No Env

Lysate   Supernatant   Pellet

Env protein incorporation in CON6 and CONs Env-pseudovirions

Fig. 17A   Fig. 17B   Fig. 17C

A.con.env (subtype A consensus env)

MRVMGIQRNCQHLWRWGTMILGMIIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYDTEVHNV
WATHACVPTDPNPQEINLENVTEEFNMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTT
NITNITDNMKGEIKNCSFNMTTELRDKKQKVYSLFYKLDVVQINKSNSSSQYRLINCNTSAITQACPKVS
FEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVMIRSENITN
NAKNIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTEWNETLQKVAKQLR
KYFNNKTIIFTNSSGGDLEITTHSFNCGGEFFYCNTSGLFNSTWNGNGTKKKNSTESNDTITLPCRIKQI
INMWQRVGQAMYAPPIQGVIRCESNITGLLLTRDGGDNNSKNETFRPGGGDMRDNWRSELYKYKVVKIEP
LGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQ
HLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQSEIWDNMTWLQWDK
EISNYTDIIYNLIEESQNQQEKNEQDLLALDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLS
VINRVRQGYSPLSFQTHTPNPGGLDRPGRIEEEGGEQGRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRD
FILIAARTVELLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLLDTIAIAVAGWTDRVIEIGQRI
CRAILNIPRRIRQGLERALL

Fig. 18A

Fig. 18B

A.con.env (subtype A consensus env. Identical amino acid
sequence to that in the public domain)

```
GCCGCCGCCATGCGCGTGATGGGCATCCAGCGCAACTGCCAGCACCTGTG
GCGCTGGGGCACCATGATCCTGGGCATGATCATCATCTGCTCCGCCGCCG.
AGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCC
GAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGT
GCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCC ·  ··
AGGAGATCAACCTGGAGAACGTGACCGAGGAGTTCAACATGTGGAAGAAC
AACATGGTGGAGCAGATGCACACCGACATCATCTCCCTGTGGGACCAGTC
CCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGCT
CCAACGTGAACGTGACCACCAACATCACCAACATCACCGACAACATGAAG
GGCGAGATCAAGAACTGCTCCTTCAACATGACCACCGAGCTGCGCGACAA
GAAGCAGAAGGTGTACTCCCTGTTCTACAAGCTGGACGTGGTGCAGATCA
ACAAGTCCAACTCCTCCTCCCAGTACCGCCTGATCAACTGCAACACCTCC
GCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCA
CTACTGCGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAAGGACAAGGAGT
TCAACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCAC
GGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGC
CGAGGAGGAGGTGATGATCCGCTCCGAGAACATCACCAACAACGCCAAGA
ACATCATCGTGCAGCTGACCAAGCCCGTGAAGATCAACTGCACCCGCCCC
AACAACAACACCCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTA
CGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACGTGT
CCCGCACCGAGTGGAACGAGACCCTGCAGAAGGTGGCCAAGCAGCTGCGC
AAGTACTTCAACAACAAGACCATCATCTTCACCAACTCCTCCGGCGGCGA
CCTGGAGATCACCACCCACTCCTTCAACTGCGGCGGCGAGTTCTTCTACT
GCAACACCTCCGGCCTGTTCAACTCCACCTGGAACGGCAACGGCACCAAG
AAGAAGAACTCCACCGAGTCCAACGACACCATCACCCTGCCCTGCCGCAT
.CAAGCAGATCATCAACATGTGGCAGCGCGTGGGCCAGGCCATGTACGCCC
CCCCCATCCAGGGCGTGATCCGCTGCGAGTCCAACATCACCGGCCTGCTG
CTGACCCGCGACGGCGGCGACAACAACTCCAAGAACGAGACCTTCCGCCC
CGGCGGCGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACA
AGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCGC
CGCGTGGTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCT
GGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCC
TGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCC
AACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGAAGCTGACCGT
GTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACC
TGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATC
TGCACCACCAACGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGTC
CGAGATCTGGGACAACATGACCTGGCTGCAGTGGGACAAGGAGATCTCCA
ACTACACCGACATCATCTACAACCTGATCGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGACCTGCTGGCCCTGGACAAGTGGGCCAACCTGTG
GAACTGGTTCGACATCTCCAACTGGCTGTGGTACATCAAGATCTTCATCA
TGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCC
GTGATCAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCA
CACCCCCAACCCCGGCGGCCTGGACCGCCCCGGCCGCATCGAGGAGGAGG
GCGGCGAGCAGGGCCGCGACCGCTCCATCCGCCTGGTGTCCGGCTTCCTG
GCCCTGGCCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCG
CCTGCGCGACTTCATCCTGATCGCCGCCCGCACCGTGGAGCTGCTGGGCC
ACTCCTCCCTGAAGGGCCTGCGCCTGGGCTGGGAGGGCCTGAAGTACCTG
TGGAACCTGCTGCTGTACTGGGGCCGCGAGCTGAAGATCTCCGCCATCAA
CCTGCTGGACACCATCGCCATCGCCGTGGCCGGCTGGACCGACCGCGTGA
TCGAGATCGGCCAGCGCATCTGCCGCGCCATCCTGAACATCCCCCGCCGC
ATCCGCCAGGGCCTGGAGCGCGCGCTGCTGTAGAA  F 26)
```
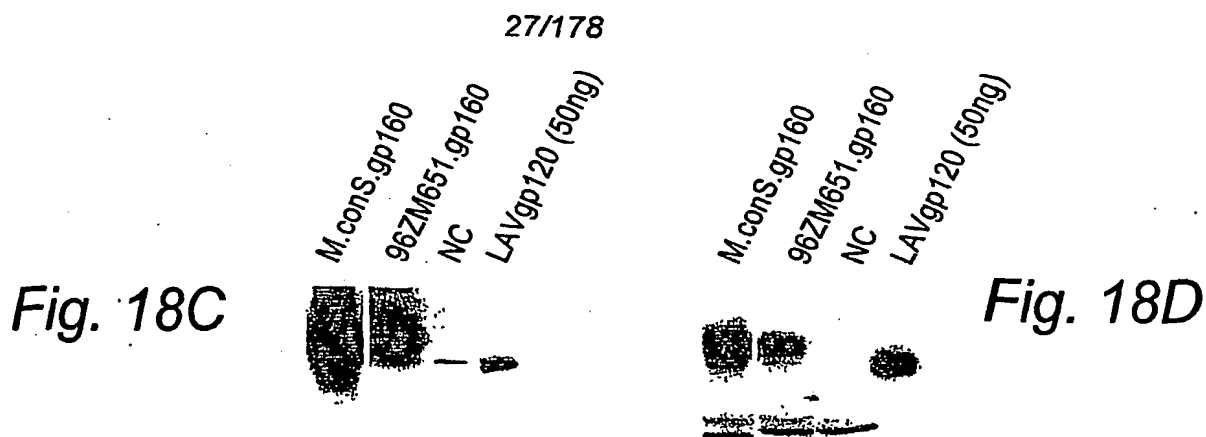
M.conS.gp160
96ZM651.gp160
NC
LAVgp120 (50ng)

Fig. 18C

M.conS.gp160
96ZM651.gp160
NC
LAVgp120 (50ng)

Fig. 18D

Cell lysate   **Supernatant**

Expression of A.con env gene in mammalian cells

M.con.gag (group M consensus gag. Identical amino acid sequence to that in the public domain)

Fig. 19A

```
GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGA
CGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCC
TGAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAAC
CCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCGGCCAGCT
GCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCACCAGCGCATCGAGGTGAAGGACACC
AAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAA
GACCCAGCAGGCCGCCGCCGACAAGGGCAACTCCTCCAAGGTGTCCCAGA
ACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATC
TCCCCCCGCACCCTGAACGCCTGGGTGAAGGTGATCGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCG
CCTGCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATC
GCCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCG
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GACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCACCCAGGACGTGAA
GAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCGGCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGC
CGAGGCCATGTCCCAGGTGACCAACGCCGCCATCATGATGCAGCGCGGCA
ACTTCAAGGGCCAGCGCCGCATCATCAAGTGCTTCAACTGCGGCAAGGAG
GGCCACATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAA
GTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTC
CTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCTT
CGGCGAGGAGATCACCCCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGC
CCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGACCCCCTGTCCCAG
TGA
```

Fig. 19B

```
GCCGCCGCCATGCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGACCAT
CAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTGGCCACCGGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
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GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGATCGGCTGCCACC
CTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGA
TCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCCATCTTCGCCATCAA
GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
ACAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCC
GCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGC
CTACTTCTCCGTGCCCCTGGACGAGGACTTCCGCAAGTACACCGCCTTCA
CCATCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCAT
GACCAAGATCCTGGAGCCCTTCCGCACCCAGAACCCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGCGCTGGGGCTT
CACCACCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGG
GCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCC
GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
GAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGAAGCAGCTGTGCA
AGCTGCTGCGCGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
AGCAGGGCCAGGACCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAG
AACCTCAAGACCGGCAAGTACGCCAAGATGCGCTCCGCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCACCGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACC
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TGGGAGACCTGGTGGACCGAGTACTGGCAGGCCACCTGGATTCCCGAGTG
GGAGTTCGTGAACACCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCCCATCGCCGGCGCCGAGACCTTCTACGTGGACGGCGCCGCCAAC
CGCGAGACCAAGCTGGGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCA
GAAGGTGGTGTCCCTGACCGAGACCACCAACCAGAAAACCGAGCTGCAGG
CCATCCACCTGGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
GACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACAAGTCCGA
GTCCGAGCTGGTGAACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGG
TGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAG
GTGGACAAGCTGGTGTCCACCGGCATCCGCAAGGTGCTGTTCCTGGACGG
CATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCG
CCATGGCCTCCGACTTCAACCTGCCCCCCATCGTGGCCAAGGAGATCGTG
GCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGT
GGACTGCTCCCCCGGCATCTGGCAGCTGGACTGCACCCACCTGGAGGGCA
AGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAG
GTGATCCCCGCCGAGACCGGCCAGGAGACCGCCTACTTCATCCTGAAGCT
GGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACT
TCACCTCCGCCGCCGTGAAGGCCGCCTGCTGGTGGCCGGCATCCAGCAG
GAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCAT
GAACAAGGAGCTGAAGAAGATCATCGGCCAGGTGCGCGACCAGGCCGAGC
ACCTCAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGC
AAGGGCGGCATCGGCGGCTACTCCGCCGGCGAGCGCATCATCGACATCAT
CGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCC
AGAACTTCCGCGTGTACTACCGCGACTCCCGCGACCCCATCTGGAAGGGC
CCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAA
CTCCGACATCAAGGTGGTGCCCCGCCGCAAGGCCAAGATCATCCGCGACT
ACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGGCCGCCAGGACGAG
GACTAA
```

Fig. 19C

M.con.nef (group M consensus nef. Identical amino acid sequence
to that in the public domain)

GCCGCCGCCATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCC
CGCCGTGCGCGAGCGCATCCGCCGCACCCACCCCGCCGCCGAGGGCGTGG
GCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAAC
ACCGCCGCCAACAACCCCGACTGCGCCTGGCTGGAGGCCCAGGAGGAGGA
GGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGA
CCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTGAAGGAGAAGGGCGGC
CTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTG
GGTGTACCACACCCAGGGCTACTTCCCCGACTGGCAGAACTACACCCCCG
GCCCCGGCATCCGCTACCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTG
CCCGTGGACCCCGAGGAGGTGGAGGAGGCCAACGAGGGCGAGAACAACTC
CCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGG
TGCTGATGTGGAAGTTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGC
GAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 19D

C.con.pol.nuc

GCCGCCGCCATGCCCCAGATCACCCTGTGGCAGCGCCCCCTGGTGTCCAT
CAAGGTGGGCGGCCAGATCAAGGAGGCCCTGCTGGCCACGGCGCCGACG
ACACCGTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCT
GATCGAGATCTGCGGCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCCCA
CCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGCTGGGCTGCACC
CTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCC
CGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGA
TCAAGGCCCTGACCGCCATCTGCGAGGAGATGGAGAAGGAGGGCAAGATC
ACCAAGATCGGCCCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAA
GAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGA
ACAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCC
GCCGGCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGC
CTACTTCTCCGTGCCCCTGGACGAGGGCTTCCGCAAGTACACCGCCTTCA
CCATCCCCTCCATCAACAACGAGACCCCCGGCATCCGCTACCAGTACAAC
GTGCTGCCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCAT
GACCAAGATCCTGGAGCCCTTCCGCGCCCAGAACCCCGAGATCGTGATCT
ACCAGTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAG
CACCGCGCCAAGATCGAGGAGCTGCGCGAGCACCTGCTGAAGTGGGGCTT
CACCACCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGG
GCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCC
GAGAAGGACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCT
GAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGCGCCAGCTGTGCA
AGCTGCTGCGCGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAG
GAGGCCGAGCTGGAGCTGGCCGAGAACCGCGAGATCCTGAAGGAGCCCGT
GCACGGCGTGTACTACGACCCCTCCAAGGACCTGATCGCCGAGATCCAGA
AGCAGGGCCACGACCAGTGGACCTACCAGATCTACCAGGAGCCCTTCAAG
AACCTCAAGACCGGCAAGTACGCCAAGATGCGCACCGCCCACACCAACGA
CGTGAAGCAGCTGACCGAGGCCGTGCAGAAGATCGCCATGGAGTCCATCG
TGATCTGGGGCAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACC
TGGGAGACCTGGTGGACCGACTACTGGCAGGCCACCTGGATTCCCGAGTG
GGAGTTCGTGAACACCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGA
AGGAGCC??????????????????????????????CGCCGCCAAC

Fig. 19D (continued)

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CGCCGAGACCAAGATCGGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCA
GAAGATCGTGTCCTGACCGAGACCACCACCAACCAGAAAACCGAGCTGCAGG
CCATCCAGTCGCCCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACC
GACTCCCAGTACGCCCTGGGCATCATCCAGCCCGACCAGAGCGCGCGA
GTCCGAGCTGGTGAACCAGATCATCGAGCAGCTGATCAAGAAGGAGCGCG
TGTACCTGTCCTGGGTGCCCGCCACAAGGGCATCGGCGGCAACGAGCAG
GTGGACAAGCTGGTCTGTCCTCCGGCATCCGCAAGGTGCTGTTCCTGACGG
CATCGACGAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGCCGCG
CCATGGCCCTGCCAGTTCAACCTGCCCAGTGAGGGCGGCCAAGGAGATCGTG
GCCTCCTGCCACAAGTGCCAGCTGGACTGCACGCCCATCGAGGCGCAGGT
GGACTGCTCCCCCGGCATCGGCGAGCTGCTGGCCTCCGGCTACATCGAGGCCGAG
AGATCATCGGAGCCTCTGGTGGCCGTGCACGTGCCTCCGGCTACATGCAGGCCGAG
GTGATCCCCGCGGCCTGGCCCGAGAGACCGGCCAGGAGACCGGCATCCAGATCC
GGCCGGCCGCCTGCCCGTGAAGGTCCGCCGCTGTCGGTGGGCCATCCAGCAG
TCACCTCCGCCGCCCGTGACAACCCCCAGTCCCAGGGCCGTGGTGGAGTCCAT
GAGTTCGGCATCCCCTACAACCCCCAGTCCGCCAGGGCCGTGGTGGAGTCCAT
GAACAAGGAGCTGAAGACCGCCGTGCAGATGCATCGGCCGTGCGCGACCAGGCCGAGC
ACCTCAAGACCGCCGTGCAGACCCGCTACTCCGCGGCGCATCATCGACACTCAT
AAGGGCGGCATCGGCGGCTACTCCGCGCTGCAGAAGGAGCCATCATCGACACTCAT
CGCCACCGACATCCAGAACCAAGGAGCTGCAGAAGCAAGCAGATCATCAAGATCC
AGAACTTCGGCTGTACTACGCCGCGACTCCCGCGACCCCATCTGGAAGGGC
CCCGCCAAGTGCTGTGAAGGTGGTGCCCCGCCGCAAGGCCAAGATCATCAAGGAGACT
CTCCGACACTCAAGGTGGTGCCCCGCCGCAAGGCCAAGATCATCAAGGAGACT
ACGGCAAGCAGATGGCCGGCCGCGCCGACTGCGCCGGCCGCCGGCCAGGACGAG
GACTAA
```

Fig. 19E

M.con.gag (group M consensus gag)

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEG CKQIIGQLQPA
LQTGSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSQQKTQQAAADKGNSSKVSQNYPIVQN
LQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKDTINE
EAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGEIYKRWIILGLNKIVRMY
SPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMM
TACQGVGGPGHKARVLAEAMSQVTNAAIMMQRGNFKGQRRIIKCFNCGKEGHIARNCRAPRKKGCWKCGK
EGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGFGEEITPSPKQEPKDKEPPLTSLK
SLFGNDPLSQ

M.con.pol (group M consensus pol)

MPQITLWQRPLVTIKIGGQLKEALLaTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGK
KAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTEICTE
MEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLD
VGDAYFSVPLDEDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVI
YQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
SWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAENREILKEPVHGVYYD
PSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFR
LPIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKLGKAGYVTD
RGRQKVVSLTETTNQKTELQAIHLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEK
VYLSWVPAHKGIGGNEQVDKLVSTGIRKVFLDGIDKAQEEHEKYHSNWRAMASDFNLPPIVAKEIVASC
DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPV
KVIHTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAV
FIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVV
IQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED

Fig. 19F

M.con.nef (group M consensus nef)

MGGKWSKSSIVGWPAVRERIRRTHPAAEGVGAVSQDLDKHGAITSSNTAANNPDCAWLEAQEEEEVGFP
VRPQVPLRPMTYKAALDLSHFLKEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTF
GWCFKLVPVDPEEVEEANEGENNSLLHPMCQHGMEDEEREVLMWKFDSRLALRHIARELHPEYYKDC

Fig. 19G

C.con.pol (subtype C consensus pol)

MPQITLWQRPLVSIKVGGQIKEALLaTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGK
KAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTAICEE
MEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLD
VGDAYFSVPLDEGFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVI
YQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKD
SWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAENREILKEPVHGVYYD
PSKDLIAEIQKQGHDQWTYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTD
RGRQKIVSLTETTNQKTELQAIQLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKER
VYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASEFNLPPIVAKEIVASC
DKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPV
KVIHTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAV
FIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVV
IQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDED

Fig. 19H

Fig. 20A

B.con.gag (subtype B consensus gag. The amino acid sequence is
different from Los Alamos Database August 2002)

GCCGCCGCCATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGAGCTGGA
CCGCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGC
TGAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAAC
CCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGGGCCAGCT
GCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACA
CCGTGGCCACCCTGTACTGCGTGCACCAGCGCATCGAGGTGAAGGACACC
AAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAA
GGCCCAGCAGGCCGCCGCCGACACCGGCAACTCCTCCCAGGTGTCCCAGA
ACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATC
TCCCCCCGCACCCTGAACGCCTGGGTGAAGGTGGTGGAGGAGAAGGCCTT
CTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCC
CCCAGGACCTGAACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCC
ATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCG
CCTGCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGC
CCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATC
GGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCG
CTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCACCT
CCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTG
GACCGCTTCTACAAGACCCTGCGCGCCGAGCAGGCCTCCCAGGAGGTGAA
GAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCA
AGACCATCCTGAAGGCCCTGGGCCCCGCCGCCACCCTGGAGGAGATGATG
ACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGC
CGAGGCCATGTCCCAGGTGACCAACTCCGCCACCATCATGATGCAGCGCG
GCAACTTCCGCAACCAGCGCAAGACCGTGAAGTGCTTCAACTGCGGCAAG
GAGGGCCACATCGCCAAGAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTG
GAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAAC
TTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAGGAGTCCTTCCG
CTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACA
AGGAGCTGTACCCCCTGGCCTCCCTGCGCTCCCTGTTCGGCAACGACCCC
TCCTCCCAGTAA

Fig. 20B

B.con.env (subtype B consensus env. The amino acid sequence is
different from Los Alamos Database August 2002)

GCCG CCGCCATGCGCG TGAAGGG CATCC GCAAGAA CTACCAG CAC CTGTG
GCGCTGGGG CA CCA TG CTGCTGGGCATG CT GATGA TCTGC TC CGC CG CCG
AGAAG CT GTGGG TGACCGTGTA CTACGG CG TGCCCGTGTG GAAGG AGGC C
ACCA CCACC CTGTTCT GCGCCTC CGACG CCAAGGC CTACG ACACC GA GG T
GCACAA CGTGTGGGCCACCCA CG CCTGCGTGCCCA CCGAC CC CAA CC CCC
AGGA GG TGG TG CTGGA GAACG TGAC CGAGA ACTTCAA CAT GTGGA AGAA C
AACA TGGTGGA GCAGA TGCACGAGGA CA TCATCTC CCTGTGGGAC CA GTC
C CT GAAGCCCTGCGTGAAGCTGACC CC CCT GTGCGTGACC CT GAA CTGCA
CCGA CCTGAAGAACAA CCTGCTGAA CAC CAACT CCTCCTC CGGCGAGAAG
ATGGAGAAGGG CGAGA TCAAGAA CT GCT CCTTCAA CATCA CCACC TC CAT
CCGCGA CAAGG TGCAGAAGGAGTACGCC CTGTT CTACAAG CTGGA CGTGG
TGCC CATCGACAACAA CAACAACAC CTC CTACCGC CTGAT CT CCTGCAAC
AC CT CCG TGATCAC CCAGG CCTGC CC CAAGGTGTC CTTCGAG CCCATCCC
CATC CACTA CT GCGCC CC CGC CGGC TTCGC CATC CTGAAG TGCAA CGACA
AGAA GTTCAA CGGCAC CGGCC CCTG CAC CAACGTGTC CAC CG TGCAGTG C
ACCCACGGCAT CCGCC CCGTGGTGT CCA CC CAGCTGCTGC TGAACGG CTC
CCTGGC CGAGGAGGAG GTGG TGA TC CGC TC CGAGA ACTTCACCGA CAACG
C CAAGA CCAT CATCG TGCAG CTGAA CGAGTCCG TGGAGAT CAACTG CACC
CGCCC CAACAACAA CA CC CGCAAGT CCA TC CACAT CGGCC CCGGC CGCGC
CTTCTA CACCA CCGGCGAGAT CA TCGGCGA CATCCGCCAGG CCCA CTGCA
ACAT CTCCC GCGCCAAGTGGAACAA CAC CC TGAAG CAGAT CG TGAAGAAG
CTGCGCGAG CAGTT CGGCAACAAGA CCA TCGTGTT CAACCAGTCC TCCGG
CGGCGA CCC CGAGA TCGTGATGCACT CCTT CAACTGCGGCGG CGAGTTCT
TCTA CTGCAACACCAC CCAGCTGTT CAA CT CCACCTGGAA CGACAACGG C
ACCTGGAACAA CAC CAAGGACAAGAACA CCATCAC CCTGC CCTGC CGCAT
CAAG CAGAT CA TCAACATGTGGCAG GAG GTGGG CAAGGCCATGTA CG CCC
CCCC CA TCCGCGGCC CA GATCC GCTGCTC CT CCAACATCAC CGGCC TGCTG
CTGAC CC GCGAC GGCGG CAACAACAACAA CGACAC CGAGA TC TTC CG CCC
CGGCGG CGG CGA CATG CGCGA CAAC TGG CG CTC CGAGCTG TA CAAGTACA
AGGT GG TGAAGATCGA GCCCC TGGG CGT GG CCC CCACCAAGG CCAAG CGC
CG CG TGGTG CAGCG CGAGAAG CG CG CCG TGGGCAT CGGCG CCATG TT CCT
GGGCTT CCT GGGCG CCGCCGG CT CCACCAT GGG CG CCGCC TC CAT GA CCC
TGAC CG TG CAGGC CCG CCAGCTG CTGTC CGGCATCGTGCAGCAGCAGAA C
AA CCTGCTG CG CGCCA TCGAGGC CCAGCAG CACCTGCTGCAG CTGACCGT
GTGGGG CAT CAAGCAG CTGCAGGC C CGC GTGCTGG CCGTGGAGCG CTAC C
TGAA GGACCAG CAGCT GCTGGGCAT CTGGGGCTGC TCCGG CAAGCTGATC
TGCA CCACCAC CGTGCC CTGGAACG CCT CCTGGTC CAACAAG TCC CTGGA
CGAGA TCTGGGA CAACA TGACCTGGA TGGAGTG GGAGCGC GA GAT CGACA
ACTA CA CCT CC CTGAT CTACA CC CTGAT CGAGGAG TCCCA GAACCAG CAG
GAGAAGAAC GAGCAGGAG CTG CTGGAGC TGGACAA GTGGG CCTCC CTGTG
GAACTGGTT CGACA TCACCAA CTGGCTG TGGTA CA TCAAGAT CTT CATCA
TGAT CGTGGGCGGCCT GATCGGC CTGCG CA TCGTGTT CGC CGTGCTGTCC
A TCGTGAA CCGCG TG CGC CAGGGC TACTCC CC CCTGTCC TTC CAGAC CCG
CCTG CC CGC CC CC CGC GGCCC CGAC CGC CC CGAGGGCATC GA GGA GGAGG
GCGG CGAGCGC GACCG CGACCG CTC CGG CC GCCTGGTGGA CGGCT TC CTG
GCC CTGATCTG GGACGACCTG CGCT CCC TGTGCCTG TTCT CCTAC CA CCG
CCTG CG CGA CCTGCTG CTGAT CG TGACC CG CATCG TGGAG CTG CTGGGC C
GC CG CGG CTG GGAG GTGCTGAAGTACTG GTG GAAC CTGCTGCAGTA CTGG
TC CCAGGAG CTGAAGAACTCCGC CG TGT CC CTG CTGAACG CCACCGC CA T
CGCCG TGGC CGAGGGCACCGA CCGCG TGAT CGAGG TGGTG CAGCG CG CCT
GCCG CG CCA TC CTGCA CATCC CC CG CCG CATCCGC CAGGG CCTGGAG CG C
GC CCTGCTG TAA

Fig. 20C

B.con.gag (subtype B consensus gag)

MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQT
GSEELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQG
QMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAA
EWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPT
SILDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTAC
QGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFRNQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEG
HQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESFRFGEETTTPSQKQEPIDKELYPLASLR
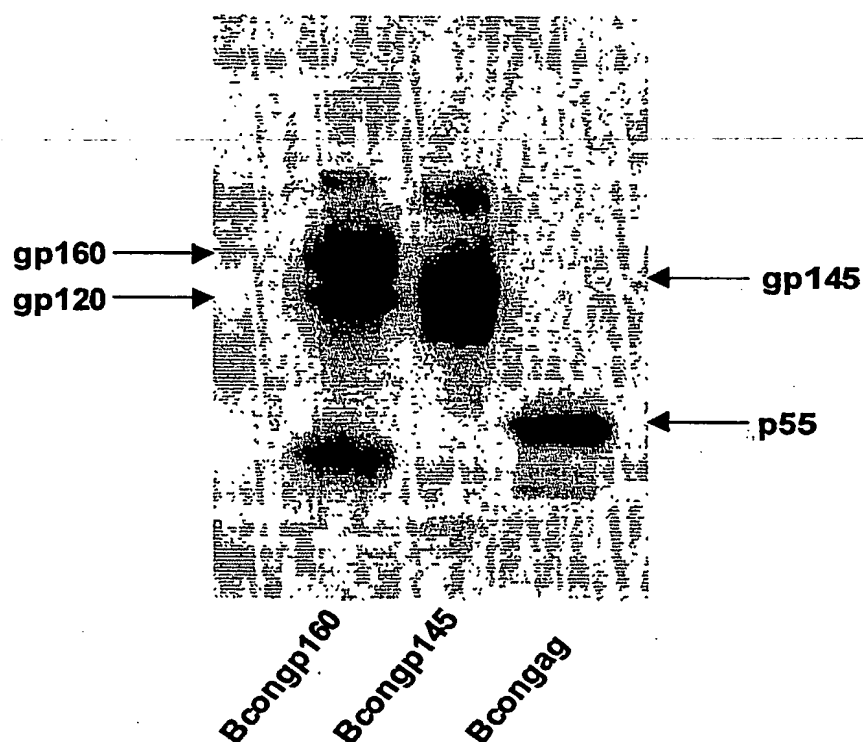SLFGNDPSSQ

Fig. 20D

B.con.env (subtype B consensus env)

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAEKLWVTVYYGVPVWKEATTTLFCASDAKAYDTEVHNVWAT
HACVPTDPNPQEVVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKNNLLNT
NSSSGEKMEKGEIKNCSFNITTSIRDKVQKEYALFYKLDVVPIDNNNTSYRLISCNTSVITQACPKVSF
EPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEEVVIRSENFTDN
AKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKKLRE
QFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNDNGTWNNTKDKNTTTLPCRIKQIINM
WQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNNNDTEIFRPGGGDMRDNWRSELYKYKVVKIEPLGV
APTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQNNLLRAIEAQQHLL
QLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTTVPWNASWSNKSLDEIWDNMTWMEWEREID
NYTSLIYTLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVN
RVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRDRSGRLVDGFLALIWDDLRSLCLFSYHRLRDLLL
IVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHIPRR
IRQGLERALL

Fig. 21

Expression of subtype B consensus *env* and *gag* genes in 293T cells. Plasmids containing codon-optimized subtype B consensus *gp160, gp140,* and *gag* genes were transfected into 293T cells, and protein expression was examined by Western Blot analysis of cell lysates. 48-hours post-transfection, cell lysates were collected, total protein content determined by the BCA protein assay, and 2 µg of total protein was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with serum from an HIV-1 subtype B infected individual.

Fig. 22
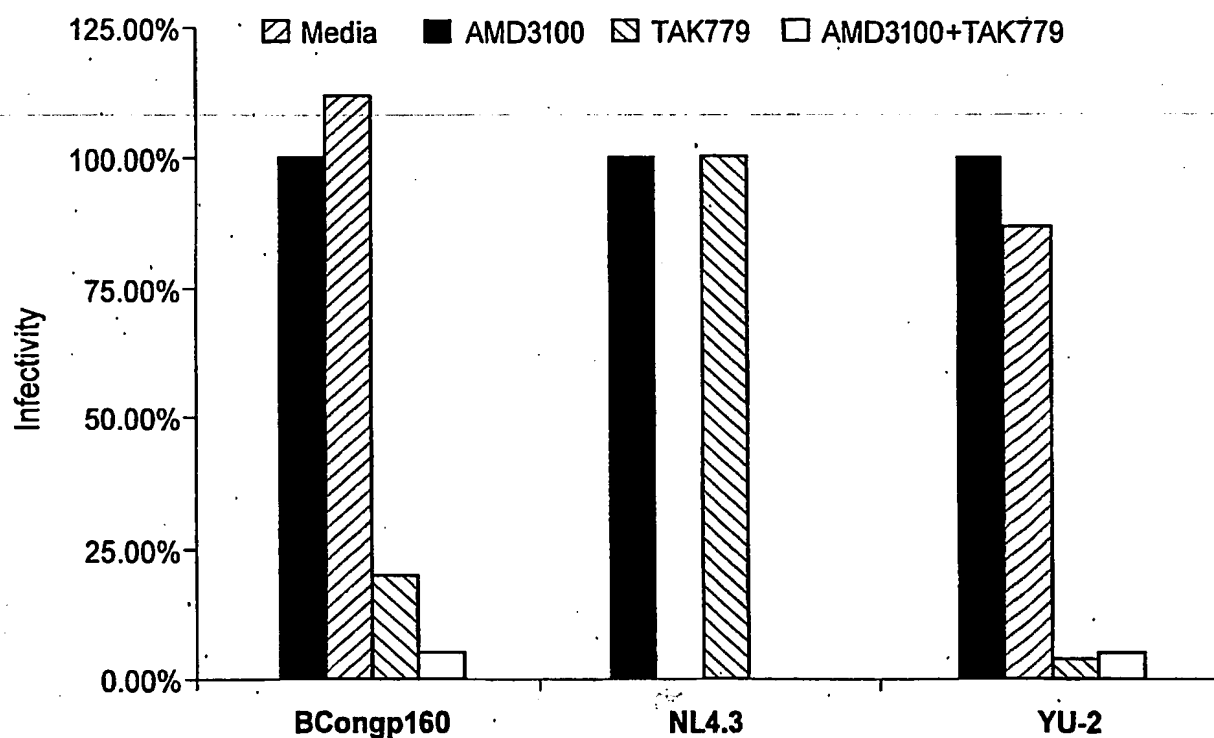
Co-receptor usage of subtype B consensus envelopes.
Pseudotyped particles containing the subtype B consensus gp160 Env
were incubated with DEAE-Dextran treated JC53-BL cells in the
presence of AMD3100 (a specific inhibitor of CXCR4), TAK779 (a
specific inhibitor of CCR5), and AMD3000+TAK779 to determine co-
receptor usage. NL4.3, an isolate known to utilize CXCR4 and YU-2,
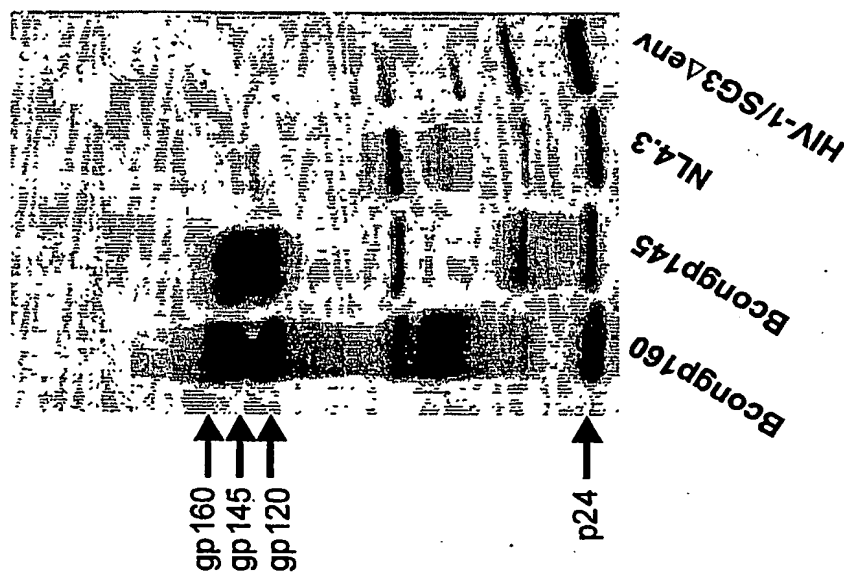a known CCR5-using isolate, were included as controls.

Fig. 23A

Trans complementation of env-deficient HIV-1 with codon-optimized subtype B consensus gp160 and gp140 genes.

Plasmids containing codon-optimized, subtype B consensus gp160 or gp140 genes were co-transfected into 293T cells with an HIV-1/SG3Δenv provirus. 48-hours post-transfection cell supernatants containing pseudotyped virus were harvested, clarified in a tabletop centrifuge, filtered through a 0.2μM filter, and pellet through a 20% sucrose cushion. Quantification of p24 in each virus pellet was determined using the Coulter HIV-1 p24 antigen assay; 25ng of p24 was loaded per lane on a 4-20% SDS-PAGE gel. Proteins were transferred to a PVDF membrane and probed with anti-HIV-1 antibodies from infected HIV-1 subtype B patient serum. Trans complementation with a rev-dependent NL4.3env was included for control.

Fig. 23B
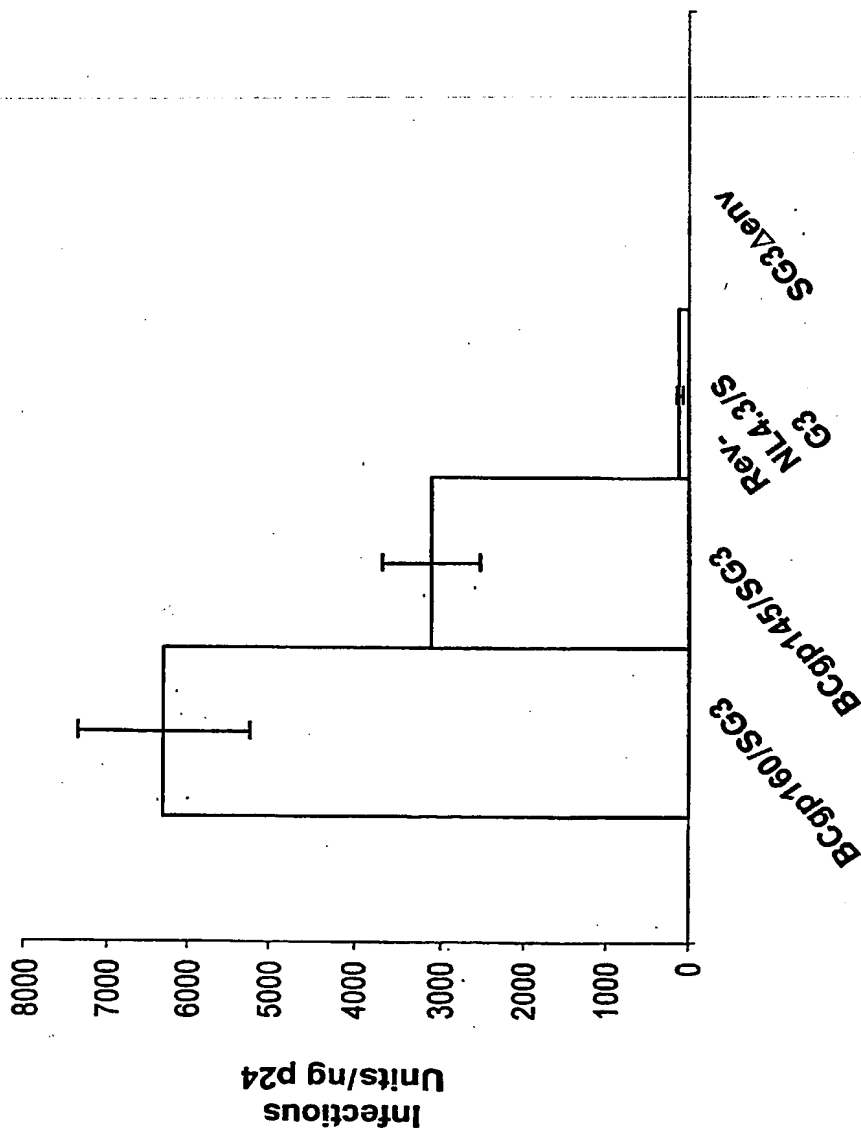
Infectivity of virus particles containing the subtype B concensus envelope.
Infectivity of pseudotyped virus containing consensus B gp160 or gp140 was determined using the
JC53-BL assay. Sucrose cushion purified virus particles were assayed by the Coulter p24 antigen assay,
and 5-fold serial dilutions of each pellet were incubated with DEAE-Dextran treated JC53-BL cells.
Following a 48-hour incubation period, cells were fixed and stained to visualize β-galactosidase
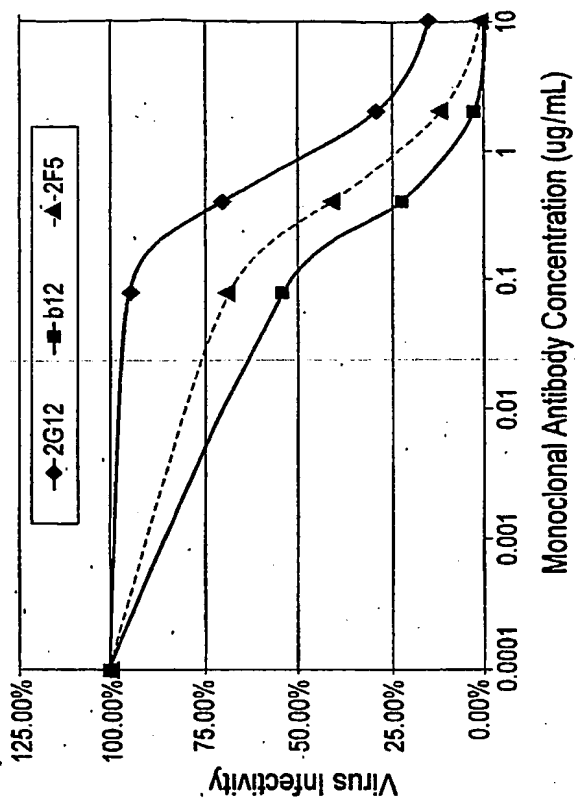expressing cells. Infectivity is expressed as infectious units per ng of p24.

Fig. 24B

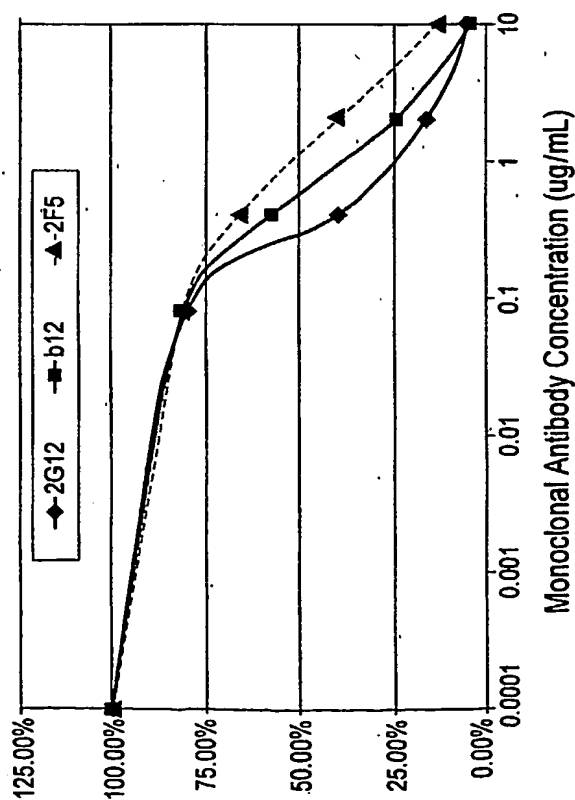Neutralization of Pseudovirions containing NL4.3 Env (gp160)

Fig. 24A

Neutralization of Pseudovirions containing Subtype B consensus Env (gp160)

Fig. 24D

Neutralization of Pseudovirions
containing NL4.3 Env (gp160)

Fig. 24C

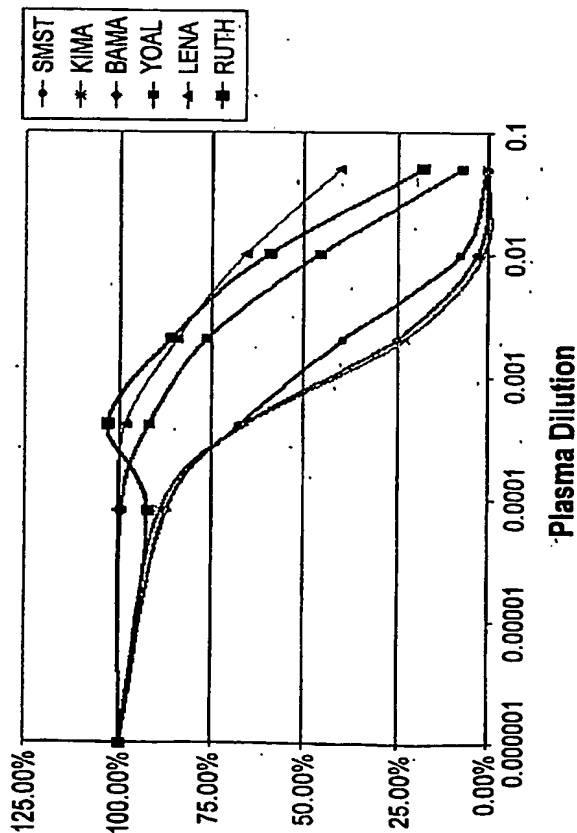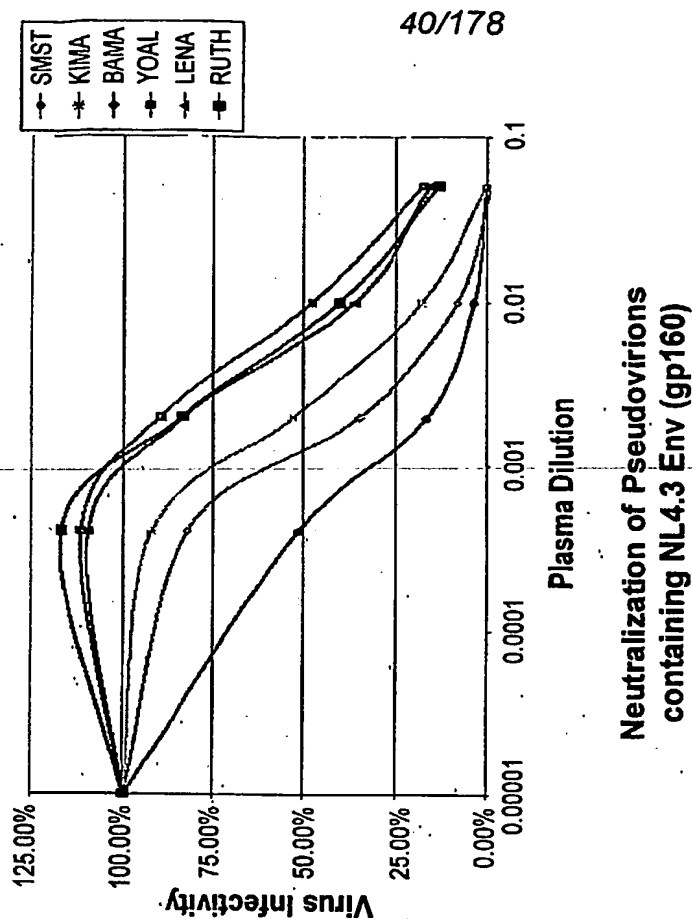Neutralization of Pseudovirions containing
Subtype B consensus Env (gp160)

Neutralization sensitivity of virions containing subtype B concensus gp 160 envelope.

Equivalent amounts of pseudovirions containing the subtype B consensus or NL4.3 Env (gp160) (1,500 infectious units) were preincubated with three different monoclonal neutralizing antibodies and a panel of plasma samples from HIV-1 subtype B infected individuals, and then added to the JC53-BL cell monolayer in 96-well plates. Plates were cultured for two days and luciferase activity was measured as an indicator of viral infectivity. Virus infectivity was calculated by dividing the luciferase units (LU) produced at each concentration of antibody by the LU produced by the control infection. The mean 50% inhibitory concentration (IC$_{50}$) and the actual % neutralization at each antibody dilution were then calculated for each virus. The results of all luciferase experiments were confirmed by direct counting of blue foci in parallel infections.

Fig. 25A
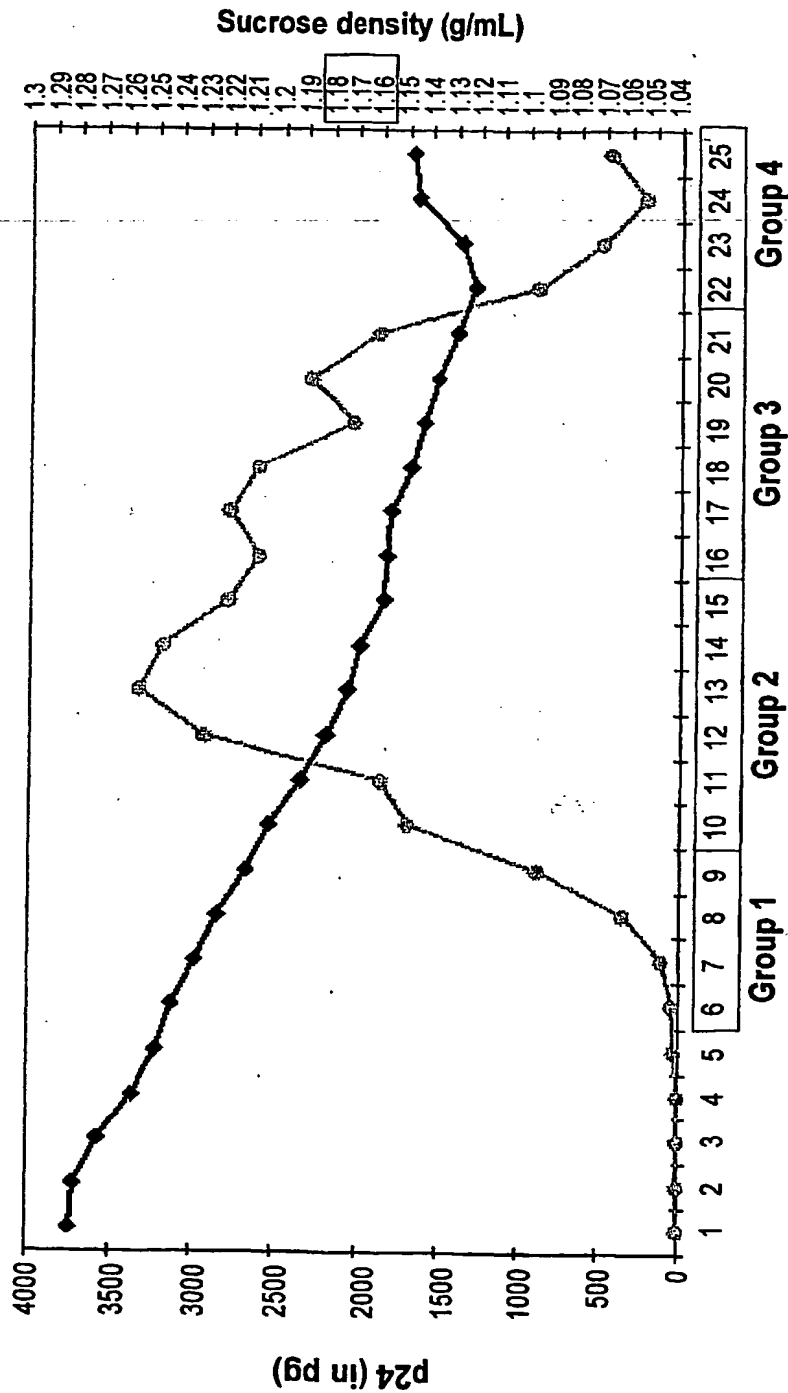
Density and p24 analysis of sucrose gradient fractions.

0.5ml fractions were collected from a 20-60% sucrose gradient. Fraction number 1 represents the most dense fraction taken from the bottom of the gradient tube. Density was measured with a refractometer and the amount of p24 in each fraction was determined by the Coulter p24 antigen assay. Fractions 6-9, 10-15, 16-21, and 22-25 were pooled together and analyzed by Western Blot. As expected, virions sedimented at a density of 1.16-1.18 g/ml.

Fig. 25B

gp160 →
gp120 →

gp55 →

Fraction Pool 1

Fraction Pool 2

Fraction Pool 3

Fraction Pool 4

Non-purified VLPs
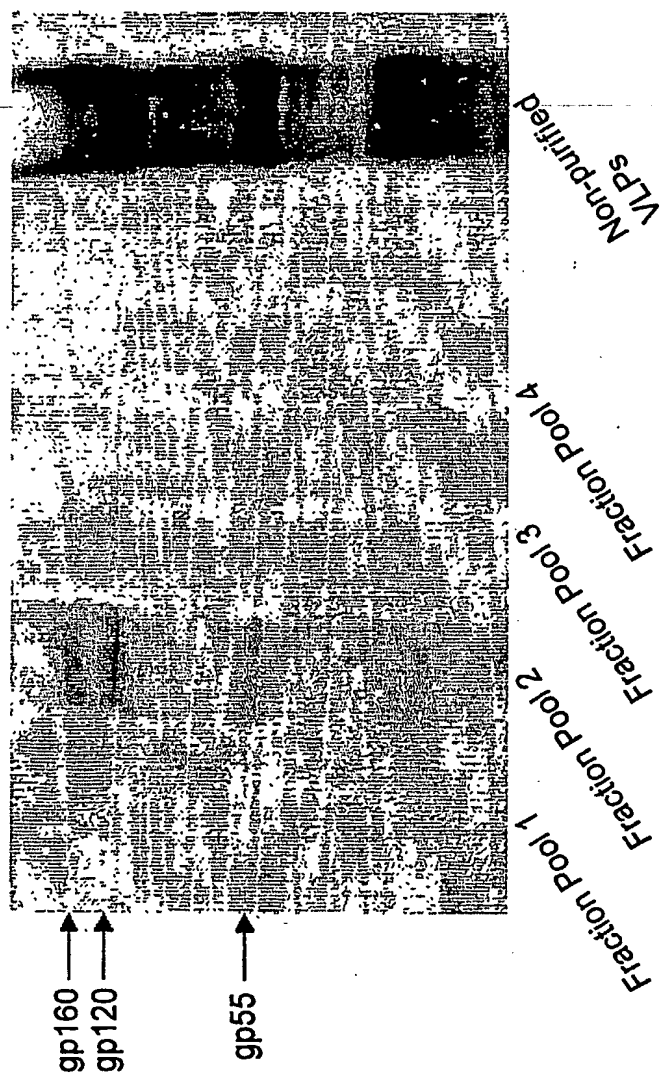
VLP production by co-transfection of subtype B consensus *gag* and *env* genes.

293T cells were co-transfected with subtype B consensus *gag* and *env* genes. Cell supernatants were harvested 48-hours post-transfection, clarified through at 20% sucrose cushion, and further purified through a 20-60% sucrose gradient. Select fractions from the gradient were pooled, added to 20ml of PBS, and centrifuged overnight at 100,000 x g. Resuspended pellets were loaded onto a 4-20% SDS-PAGE gel, proteins were transferred to a PVDF membrane, and probed with plasma from an HIV-1 subtype B infected individual.

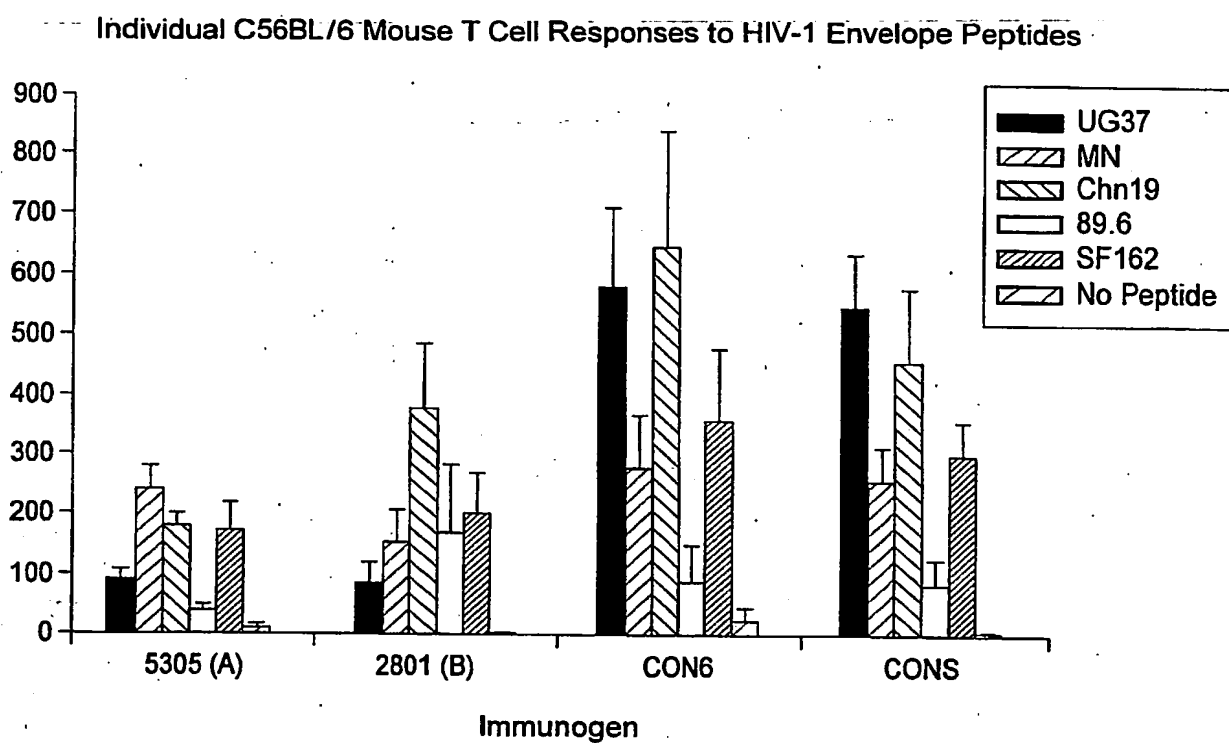## Fig. 26A

Year 2000 Con-S 140CFI.Env

MRVRGIQRNCQHLWRWGTLILGMLMICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVH
NVWATHACVPTDPNPQEIVLENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNC
TNVNVTNTTNNTEEKGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPIDDNNNNSSNYRLINCNT
SAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNG
SLAEEEIIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQA
HCNISGTKWNKTLQQVAKKLREHFNNKTIIFKPSSGGDLEITTHSFNCRGEFFYCNTSGLFNSTW
IGNGTKNNNNTNDTITLPCRIKQIINMWQGVGQAMYAPPIEGKITCKSNITGLLLTRDGGNNNTN
ETEIFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKLTVQARQLLSGIVQQQSNLLRAIEAQ
QHLLQLTVWGIKQLQARVLAVERYLKDQQLEIWDNMTWMEWEREINNYTDIIYSLIEESQNQQEK
NEQELLALDKWASLWNWFDITNWLW

A gp140 CFI is referred to HIV-1 envelope design with the cleavage-site-deleted (C), fusion-site-deleted (F) and gp41 immunodominant region-deleted (I) in addition to the deletion of transmembrane and cytoplasmic domains.

Fig. 26B

Codon-optimized Year 2000 Con-S 140CFI. seq

ATGCGCGTGCGCGGCATCCAGCGCAACTGCCAGCACCTGTGGCGCTGGGGCACCCTGATCCTGGG
CATGCTGATGATCTGCTCCGCCGCCGAGAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGT
GGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCGAGGTGCAC
AACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAA
CGTGACCGAGAACTTCAACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCT
CCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCCCCTGTGCGTGACCCTGAACTGC
ACCAACGTGAACGTGACCAACACCACCAACAACACCGAGGAGAAGGGCGAGATCAAGAACTGCTC
CTTCAACATCACCACCGAGATCCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGG
ACGTGGTGCCCATCGACGACAACAACAACAACTCCTCCAACTACCGCCTGATCAACTGCAACACC
TCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCCCC
CGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCCCTGCAAGAACG
TGTCCACCGTGCAGTGCACCCACGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGC
TCCCTGGCCGAGGAGGAGATCATCATCCGCTCCGAGAACATCACCAACAACGCCAAGACCATCAT
CGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGTCCA
TCCGCATCGGCCCCGGCCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCC
CACTGCAACATCTCCGGCACCAAGTGGAACAAGACCCTGCAGCAGGTGGCCAAGAAGCTGCGCGA
GCACTTCAACAACAAGACCATCATCTTCAAGCCCTCCTCCGGCGGCGACCTGGAGATCACCACCC
ACTCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACTCCACCTGG
ATCGGCAACGGCACCAAGAACAACAACAACACCAACGACACCATCACCCTGCCCTGCCGCATCAA
GCAGATCATCAACATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCCCCCATCGAGGGCAAGA
TCACCTGCAAGTCCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACAACACCAAC
GAGACCGAGATCTTCCGCCCCGGCGGCGGCGACATGCGCGACAACTGGCGCTCCGAGCTGTACAA
GTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCCCCCACCAAGGCCAAGCTTACCGTGCAGG
CCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCCCAG
CAGCACCTGCTGCAGCTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGA
GCGCTACCTGAAGGACCAGCAGCTCGAGATCTGGGACAACATGACCTGGATGGAGTGGGAGCGCG
AGATCAACAACTACACCGACATCATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAG
AACGAGCAGGAGCTGCTGGCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCGACATCACCAA
CTGGCTGTGGTGAGGATCC

Fig. 27

Individual C56BL/6 Mouse T Cell Responses to HIV-1 Envelope Peptides

Legend:
- UG37
- MN
- Chn19
- 89.6
- SF162
- No Peptide

Y-axis: 0, 100, 200, 300, 400, 500, 600, 700, 800, 900

X-axis (Immunogen): 5305 (A), 2801 (B), CON6, CONS

Fig. 28A

Design of expression-optimized HIV-1 envelope gp140CF

Con-B-2003 Env.pep (841 a.a.)*

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAAEKLWVTVYYGVPVWKEATTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEY
ALFYKLDVVPIDNDNTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFENGTGPCTNVSTVQCTHGIRPVVSTQ
LLLNGSLAEEEVVIRSENFTDNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPP
IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMRDNWRSELYKYKVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGA
AGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPW
NASWSNKSLDEIWDNMTWMEWEREIDNYTSLIYTLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGL
RIVFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRDRSGRLVDGFLALIWDDLRSLCLFSYHRLRDLLLIVTR
IVELLGRRGWEVLKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 28B

Con-B-140CF.pep (632 a.a.)

Nick name: 002

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAAEKLWVTVYYGVPVWKEATTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEY
ALFYKLDVVPIDNDNTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFENGTGPCTNVSTVQCTHGIRPVVSTQ
LLLNGSLAEEEVVIRSENFTDNAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQ
IVKKLREQFGNKTIVFNQSSGGDPEIVMHSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPP
IRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMRDNWRSELYKYKVKIEPLGVAPTKAKTLTVQARQLLSGIVQQQNNLLRA
IEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNASWSNKSLDEIWDNMTWMEWEREIDNYTSLIY
TLIEESQNQQEKNEQELLELDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 28C

Codon-opitmized Con-B 140CF.seq (1927 nt.)

Nick name: 002

```
TTCAGTCGACGGCCACCATGAGGGTGAAGGGTATTCCGGAAAAATTACCAACACCTGTGGCGCTGGGGAACCATGCTCCTTGGTAT
GCTGATGATTTGCAGTGCCGCCGGAGAAACTTTGGGTAACTGTGTACTACGGCGTTCCTGTCTGGAAGGAAGCTACAACCACTCTT
TTTTGTCATCCGACGCTAAAGCTTACGACACAGAGAATTTTAACATGTGCATAATGTTTGGGCGCCATGCTTGCGTCCCTACAGATCCCAACC
CCCAGGAGAGTCGTCCTTGAGAATGTCACAGAAGTTTAACATGTGGAAGAATAATATGTGTAGAACAAATGCACGAAGACATTAT
TAGCCTGTGGGACCAGTCCTTGAAGCCCTGCGTGAAACTCCACTTTGCGTCGACTTAACTGTACTGATTTGATGAACGCA
ACCAACACAAATACTACTATTATATATCGCTGGAGGGGGAAATCAAGAACTGCTCTTTCAACATCACCACTTCCATAAGGGATA
AGGTCCAGAAAGAAGAATATGCCCTGTTTTATAAACTTGATGTGGTCCCGATAGACAATGACAACAACTAGCTATCGACTGATCTCTTG
TAACACATCCGTGATTACCCAAGCTTGCCCAAAGTCAGCTTTGAACCAATAACGTGTCCACCGTGCAATGTACTCACGGAATCAGAC
ATCCTCAAGTGTAACGACAAAAAAATTCAATGGGACCGGACCTTGCCACAAACGTGTCCACCGTGCAATGTACTCACGGAATCAGAC
CTGTTGTCAGTACCCAACTCCTCTTGAACGGGTCTCTCGCGAAGAGGAGTCGTGATTAGAAGCGAAAACTTTACCGATAACGC
TAAAACAATCATTGTGCAACTTAATGAAAGCGTCGAAATTAACTGCCACCAGACCAAACAATAATACCAGAAAAATCTATTCACATA
GGGCCCGGCCCGCGCCAGTTTATACAACTGGCAGAAACTCATTGTGACATCAGCGCCGCGAAATGGA
ACAACACCCTGAAACAGACAGTCGTGAAGAAACTTCGAGAACAATTCGGTTAATAAAACAATCGTATTCAACCAAAGCTCCGGAGGCGA
CCCTGAGATAGTTATGCACTCATTCAACTGTGGCGGCGGGAGTTCTTCTATTGTTAACACAACTCAACTTTTAATAGCACTTGGAAT
GGAACATGAACAACAGAAGGAACACTCCTGCCCTGCCGGACAAATAAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGCGAGGAAAAG
CTATGTACGCCCCGCTATTCGCGGAACAAATAAGATGCTCTAGTAATATTACCGGATTGTTGCTGACACGCGAGGAAAAG
TGAAAACAGAAGATATTTAGACCTGGCCGAGGCGACATGAGAGAATAACTTGAGAAGTGAGCTTACAAATATAAAGTCGTAAAGATA
GAACCATTGGGTAGCACCAACCAAAGCAAAAACCTTGCTGTTGTTGGGCAGTATGGGAAATCAAAACAGCTTCAGGCAAGAGTGCT
ATAATCTTCTCCGAGAGATATTTTACCTGATCAATATAAATCCCTGGACAACATGACTTGGATGGAACGGGAAAATTGACAACT
GGCCGTCGAGCTGGTCGGTCTTAATAAATCCCTGATCGAAGAAATCTCAGAAGAAATCTCAGAACATATGGAACGGGAAAATTGACAACT
TGGAACGCGAGCTGGTCGGTCTTAATAAATCCCTGATCGAAGAATCTCAGAACATATGGAACGGGAAAATTGACAACT
ATACTAGTTTGATTTATACTCTGATCGAAGAATCTCAGAACCAACAGAGAAAAACGAACAGGAACTGCTGGAACTGGACAAGTG
GCATCATTGTGAACTGGTTTGACATTACTAACTGGCTGTGGTAAAGATCTTACAA
```

(For all 140CF design shown here and below, 140CF gene will be flanked with the 5'
sequence of "TTCAGTCGACGGCCACC" that contains a Kozak" sequence (GCCACCATGG/A) and
SalI site and 3' sequence of TAAAGATCTTACAA containing stop codon and BglII site.)

Fig. 29A

CON OF CON-S-2003 (829 a.a.)
MRVMGIQRNCQHLWRWGILIFGMLIICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSFNITTEIRDKKKKVYALFYKL
DVVPIDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSL
AEEEIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLRE
HFNKTIIFNPSSGGDLEITTHSFNCGGEFFYCNTSELFNSTWNGTNNTITLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNIT
GLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITL
TVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEI
WDNMTWMEWDKEINNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNR
VRQGYSPLSFQTLIPNPRGPDRPEGIEEEGGEQDRDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDLILIAARTVELLGRRGWEA
LKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRVCRAILNIPRRIRQGFERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 29B

CON-S-2003 140CF.pep (620 a.a.).
Nick name: 006
MRVMGIQRNCQHLWRWGILIFGMLIICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSFNITTEIRDKKKKVYALFYKL
DVVPIDDNNSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSL
AEEEIIRSENITNNAKTIIVQLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLRE
HFNKTIIFNPSSGGDLEITTHSFNCGGEFFYCNTSELFNSTWNGTNNTITLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNIT
GLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTKAKTLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMEWDKEINNYTDIIYSLIEESQNQQEK
NEQELLALDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

Fig. 29C

CODON-OPTIMIZED CON-S-2003 140CF.seq (1891 nt)

Nick name :006

TTCAGTCGACAGCCACCATGCGGGTCATGGGGATACAGAGGAATTGCCAGCACTTGTGGAGGTGGGGAATTTGATATTCGGGAT
GCTCATAATCTGCTCCGCTGAGAGACCTGTGGGTCACTGTGTATTACGGCGGTTCCCGTCTGGAAAGAAGCTAATACTACCCTG
TTTTGTGCAAGCGACGCCAAAGCATACGACACCGAAGTCCACAATGTCTGGGCTACCCACGCCGCCCTGTGTACCTACTGATCCAAATC
CCCAGGAAATTGTTCTTGAAAACGTAAACGAAAAACTTTAACATGTGGAAGAATAATATGGTGGAGCAAATGCACGAGGATATAAT
CAGCCTGTGGGACCAGTCCCTCAAACACCATGCGTTAAACTCACTCCACTCTGCGTGAACTCTGCGTGACCGTGAACGCAACC
AATAATACAACAACAATGAGGAGATAAAGAATTGTTCATTTAATATAACCACTGAGATACGGGATAAGAAAAAAAGGTTTATG
CACTCTTTTACAAGCTCGACGTGGTGCCCATAGACGACAATAATAGCTACCGACCCGCACCGGGATTCAATGCAATGACAAG
GGCATGCCCCCAAAGTTTCCTTCGAGCCCATACCGATTCACTACTGCGCACCCGGATTCGCCATTCTTAAATGCAATGACAAG
AAGTTCAACGGCACCGGACCCTGTAAGAACGTAAGCACTGTTCAATGTACACACTGTTCAATGCCGGTAGTGTCAACGCAGCTCC
TCCTCAACGGAAGCCTTGCAGAAGAGAGATCATTATCAGGTCAGAAATATCACTAACAACGCGAAAACAATCATTGTTCAGCT
GAATGAGTCTGTGAAATCAATTGTACCCGCCCTAATAATAAACAAGAAAGTCAATAACCTAGGATCGGACCCGGCCAGCCTTTCTAC
GCAACCGGAGATATCATCGGGGATATACGACAGGCCCACTGCAACATCATCTTCAATCCAAGTAGTGAATAAAAACTTTGCAGCAGGTAG
CCAAGAAACTGCGGGAACATTTAATAAGACAATCATCTTACTGTAATACCTCTGTAATACCTGTTCAACTGTTCAACATGGAATGCACTCAACAATACTATAACTCTT
CCTTGCAGAATAAAACAGATTATCAACATGTGGCAGGTGTGGGCAAGCAATGTATGCACCACCAATCGAAGGCAAAATAAGAT
GCACCTCCAATATTACCGGACTCCTCCTGACACGGGATGCGCGGAAACAATAACACGGAGACCTTTAGGCCAGGCGGCGGCGATAT
GAGAGATAACTGGCGCTCCGAGCTCTATAAATACAAAGTCGTTACAGCAGCAATCTAATCTTTGAGAGCGGCTATTTGAAAGACCAACAACTTCT
TTGACCGTGCAGCCAGGCAGTGTTGTGTCAGGTATCGTACAGCACGCGTCCTGGCGTGGATAAGAAATGTGCCTTGGAACAGCAGCAGCTGGTCAAATAAAAGCCAAGACGAA
TCTTGCAGCTTACCGTCTGGGCATCAAACAACTTCAGGCACCGCGTCCTGGCCGTGGATAAGAAATGTGCCTTGGAACAGCAGCAGCTGGTCAAATAAAAGCCAAGACGAA
CGGGATCTCGGGGGTGTTCTGAAAATTGATCTGCACGACAAAATGTGCCTTGGAACAGCAGCAGCTGGTCAAATAAAAGCCAAGACGAA
ATATGGGATAACATGACATGGAATGGGGATAAAGAAATTAATAATTACACTGACATTATTACTCACTTATCGAGGAATCAC
AAAATCAACAGGAAAAAATGAACAGGAACCTCTTGGCTCTGGACAAATGGGCTTCACTGTGGACCTGGTTCGACATCACAAATTG
GCTCTGGTAAAGATCTTACAA

SUBSTITUTE SHEET (RULE 26)

Fig. 30A

CONSENSUS A1-2003 (845 a.a.)

MRVMGIQRNCQHLLRWGTMILGMIIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYETEMHNVWATHACVPTDPNPQEIHL
ENVTEEFNMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTNTHEEEIKNCSFNMTTELRDKKQKVYSLFY
RLDVVQINENNSNSSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEVIIRSENITNNAKTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVA
KQLRKYFKNKTIIFTNSSGGDLEITTHSFNCGGEFFYCNTSGLFNSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGV
IRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGIGAVFLGAAGS
TMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSS
WSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLIEESQNQQEKNEQDLLALDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIV
FAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEGEGGEQGRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFLLIAARTVE
LLGHSSLKGLRLGWEGLKYLMNLLLYWGRELKISAINLVDTIAIAVAGWTDRVIEIGQRIGRAILHIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 30B

Con-A1-2003 140CF.pep (629 a.a.)
Nick name: 001

MRVMGIQRNCQHLLRWGTMILGMIIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYETEMHNVWATHACVPTDPNPQEIHL
ENVTEEFNMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTNTHEEEIKNCSFNMTTELRDKKQKVYSLFY
RLDVVQINENNSNSSYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEVIIRSENITNNAKTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVA
KQLRKYFKNKTIIFTNSSGGDLEITTHSFNCGGEFFYCNTSGLFNSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGV
IRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDNWRSELYKYKVVKIEPLGVAPTRAKTLTVQARQLLSGIVQQQSNLLRAIEA
QQHLLKLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLI
EESQNQQEKNEQDLLALDKWANLWNWFDISNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 30C

CODON-OPTIMIZED Con-A1-2003.seq
Nick name: 001 (1918 nt)

```
TTCAGTCGACAGCCACCATGAGGGTGATGGGAATCCAACGGAACTGCCAGCATCTTCTCCGGTGGGGAACGGATGATGATACTGGGAAT
GATAATAATCTGCTCTGCCGCTGAAAACCTCTGGGTCACAGTGTACTACGGAGTGCCTGTATGGAAGGACGCTGAAACCACTCTC
TTTTGTGCTTCCGATGCTAAAGCCTACGAAACCGAGATGCACAATGTTGGGCCACCCACGCCTGCGTGCCAACTGATCCTAATC
CACAAGAAATACATCTGGAGAATGTTACTGAGGAATTAACATGTGGAAAAAATAATATGGTAGAGCAAATGCACACTGACATCAT
TTCACTCTGGGACCAATCACTCAAACCCTGCGTTAAACTTACCCCCTCTGCGTGTGGAGCCCTCAATTGTAGCAACGTCAACGTCACA
AATAATACAACAACACTCACGAGGAAGAAATTAAAAATTGCTCCTTTAATATGACCACTGAACTTCGCGACAAAAAAACAAAAAG
TCTATTCACTGTTTTATAGGCTGGACGTCGTCGTCCAAATCAACGAGAACAATTCTAACAGTAGCTATCGACTTATCAATTGCAATAC
CTCTGCTATTACCCAGCTTGTCTCTAAAGTCTCTTTGAACCAATCCTATCCACTACTGTCCAATGCACTGTCCAATGCAAACCAGTAG
AAGTGCAAGGATAAGGAATTCAACGGAACTGGCCCTTGCAAGAGAGAGGTGATTATCCGAAGCACTAACTAACAATGCGAAGAC
TCAGCACTCAACTGCTCCTGAATGCTCACTCGCCGAAGAATCCAGTGAAGATCAACTGTACTAGGACCAAATAACAACTATCAGAATTGGCCCC
AATAATTGTTCAATTGACGAACCCAGTGAAGAACAACAGAGATATCATAGGTGACATCAGACAGGCCCATTGCAACGTTCAAGAAGCGAGTGGAATAAAA
CACTCCAGAAAGTGGCAAAGCCTTAATTGTGGGGGCGAATTCTTCTAACACATCTGCCCTTTAATTCTTACCTGGAATAACGGC
AATAACCACTCATAGCTTAATTGTGGGGGCGAATTCTTCTAACACATCTGCCCTTTAATTCTTACCTGGAATAACGGC
ACCATGAAAAAATACTATCACCCTCCCTTGCAGAATAAGCAACATTACTGGACTTCTTCTGACTTCCTCTTAATTCTTACCTGGAATAACGGC
CTCCCATTCAGTGTGATTCGATGTGAATGCCGGGCGATATGCCGAAGCAACATTGGCAAGTGAACTTTATAAATCAAGGATGGCGGAAATAATACCAATGA
GGAGTTGCCCCTACTAGAGCAAAAAACATTGACCGTTCAGGCCAGCTGCTCTCAGGAATCGTGCAGGCAGCAAAGTAACCTCC
ACGCTATCTCAAGGATCAGCAGCTTCTGGGGATGCTTCTGGGAAATTGATATGTACTACAAACGTACCCTGGAACTCA
AGCTGGAGTAATAAAGCCAGAAACGAATTTGGGATAATATGACCTGGCTGCAGTGGGACAAAGAAATTTCTAATTATACTCATA
TCATATACAATCTGATCGAAGAATCACAGAACCAGGAAAAGAAATGAGCAAGAGACCCTTCTGCCCTTGACAAGTGGCCTAACTT
GTGGAACTGGTTTGACATTAGCAACTGGCTGTGGTGTAAAGATCTTACAA
```

Fig. 31A

CONSENSUS C-2003 (835 a.a)

MRVRGILRNCQQWWINGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDI
VPLNENNSYRLINCNTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAE
EEIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHF
PNKTIKFEPSSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITG
LLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKVVEIKPLGIAPTKAKRRVEREKRAVGIGAVFLGFLGAAGSTMGAASITLT
VQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIW
DNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEKDLLALDSWKNLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRV
RQGYSPLSFQTLTPNPRGPDRLGRIEEEGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFLIAARAVELLGRSSLRGL
QRGWEALKYLGSLVQYWGLEKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQGFEAALQ

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design..

Fig. 31B

Con-C 2003 140CF.pep (619 a.a.)

Nick name: 003

MRVRGILRNCQQWWINGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVL
ENVTENFNMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDI
VPLNENNSYRLINCNTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAE
EEIIRSENLTNNAKTIIVHLNESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHF
PNKTIKFEPSSGGDLEITTHSFNCRGEFFYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITG
LLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKVVEIKPLGIAPTKAKTLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVW
GIKQLQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKN
EKDLLALDSWKNLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 31C

CODON-OPTIMIZED Con-C-2003 140CF (1,888 nt.)
Nick name:003

TTCAGTCGACAGCCACCATGCGAGTGAGAGAGGCATTCTGCGGAATTGTCAGCAATGGTGGATCTGGGGCATACTCGGATTCTGGAT
GCTTATGATATGCAAGTGTGTGGGGAACCTGTGGTTACCGTATACTATGGGGTTCCAGTCTCGGAAGGAGGCTAAAACAACGCTG
TTCTGTGCAAGTGACGCCAAAGCCTACGAGAAGAAGTGCACAACGTCTGGGCTACCCACGCTTGTGTTCCAACCGATCCAAACC
CCCAGGAAATCGTCCTCGAGAACGTGACTGAAAACTTTAACATGTGGAAGAATGATATGGTAGATCAGATGCACGAAGATATCAT
TTCATTGTGGGACCAATCATTGAAACCATGCGTAAAACTGACCCCCCTCTGCTAACACTTAACTGCACCAATGCAACTAATGCC
ACCAATACTATGGGCGAAATAAAAAAACTGTAGCTTTAACATTACAACGGAACTCCGGGATAAGAAACAAAAGGTCTACGCGCTCT
TTTACCGACTCGATATCGTCCCACTTAACGAGAATAATAGTTACCGCCTGATTAACTGTAACACATCAGCCCATTACGCAAGCTTG
CCCCAAAGTTTCTTTCGACCCCATCCCAATTCACTATTGTGCCCCCTGGATACGCTATACTTAAATGCAACAATAAAACATTT
AATGGAACCGGACCATGTAACACGTCAGTACCGTACACAATGTACGCACGGAATTAAACCTGTTGTCTCAACCCAGCTTCTCCTTA
ACGGCTCATTGGCGGAGGAAGAAATTATTATCAGATGAAACTTGACCAACAATGCCAAAACCATCGTGCCACCTCAATGA
ATCCGTGGAAATCGTGTGCACCAGACCAGAGACAAGCCCATTGCAACAATCAATCAGGATTGGGCCTGGAATAAGACTCTGGCCTACA
GGTGATATAATTGGCGATATTAGACAACAAGTTTCCCAATAAAACGATTAAGTTCGAGCCGTTTAAGCTGAGAAGGTTTCTAAGA
AGCTGAAGGAACACTTTCCCAATAAAAACGATTAAGTTCGAGCCTCTTCAGGAGATCACAACACACTCTTTTAA
TTGTAGAGGGGAGTTCTTCTATTGTAATACATCAAAGCTCTTTAACAGTACCTCCACTAATAGTACCATCACACTCCCC
TGCAGAATAAAGCACAAATAATCAACATGTGGCAAGAAGTTGGCCGAGCAAGTTACGCGCCATCGCAGGCAACATTACATGTA
AATCCAATATTACTGGCCCTTTTGCTGACACGAGTTACAGTATAAAGTCGTTGAAATCGCAACAGCAATCCAATCCAACACTC
CGATAATTGGCGGAGCGAGCTCTACAAGTATAAAGTCGTTGAAATGCAACAGCAATCCAATCCTGAACGTATCGCAAGACACTC
ACTGTTCAGGCTAGAACGTCTGCTCCTCCGGCATAGTGCAACAACACGAGTGCTGGCGATAGAGATATTTGAAAGATCAGCAACTCCTGGG
TCCAGCTTACCGTCTGTTCAGGTAAGCTCATCTGTACAACTGCGCGTGGGATCGGAGAACTCAAGCTCAAGCGCAGGTAGTGACTCACAGA
GATTTGGGGCTCTGTTCAGGTAAGCTCATCTGTACAACTGCGCGTGGGATCGGAGAACTCAAGCTCAAGCGCAGGTAGTGACTCACAGA
TGGGACAACATGACTTGGGGCTCTGTTCAGGTAAGCTCATCTGTACAACTGCGCGTGGGATCGGAGAACTCAAGCTCAAGC
ACCAGCAGGAGAAAAATGAGAAAAGATTTGCTCGCGCTTGAAGAATTGTGGAATTGGTTCGACATTACAAACTGGCT
CTGGTAAAGATCTTACAA

Fig. 32A

CONSENSUS G-2003 (842 a.a.)

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITL
ENVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNNTNNTKKEIKNCSFNITTEIRDKKKKEYALFY
RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEIIIRSENITDNTKVIIVQLNETIEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVK
AQLKKIFNKSITFNSSSGGDLEITTHSFNCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNIT
CRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKIVKIKPLGVAPTRARRRVVEREKRAVGLGAVLLGFLGAAGSTMG
AASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSN
KSYNEIWDNMTWIEWEREISNYTQQIYSLIEESQNQQEKNEQDLLALDKWASLWNWFDITKWLWYIKIFIMIVGGLIGLRIVFAV
LSIVNRVRQGYSPLSFQTLTHHQREPDRPERIEEGGGEQDKDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLG
RSSLKGLRLGWEGLKYLWNLLLYWGQELKNSAINLLDTIAIAVANWTDRVIEVAQRACRAILNIPRRIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 32B

Con-G-2003 140CF (626 a.a.)
Nick name: 007

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITL
ENVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNNTNNTKKEIKNCSFNITTEIRDKKKKEYALFY
RLDVVPINDNGNSSIYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLL
LNGSLAEEEIIIRSENITDNTKVIIVQLNETIEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVK
AQLKKIFNKSITFNSSSGGDLEITTHSFNCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNIT
CRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYKIVKIKPLGVAPTRARTLTVQVRQLLSGIVQQQSNLLRAIEAQQH
LLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWDNMTWIEWEREISNYTQQIYSLIEES
QNQQEKNEQDLLALDKWASLWNWFDITKWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site

Fig. 32C

CODON-OPTIMIZED Con-G-2003 140CF.seq
Nick name:007

TTCAGTCGACAGCCACCATGCAGCCGAGTGAAGGAGGAATCCAGAGGAATTGGCAGCAGCCACCTTTGGAAGTGGGGCACACTCATCCTCCGGCCT
TGTGATCATATGCTCTGCCTCAAATAACCTTTGGGTCACAGTTTATTACGGCGTGCCCGTTTGGGAGGACGCGCAGACACAACTCTT
TTTGTGCCAGCGACGCTAAGGCTTATTCAACAGAGAGGCATAACGTTTGGGCTACACATGCATGCGGTGCCGACCGATCCTAATC
CCCAGGAAATCACTCTTGAGAATGTTACAGAGAATTTTAATATGTGGAAGAACAACATGGTTGAACAGATGCATGAAGACATAAT
TTCTCTCTGGGATGAATCCTCTGAAACCTTGCGTGAAGCTTACACCACTGTGCGTTAACATAACCACCAGAAATTCTTCCATCACTGT
AATAATAATACCAACAACAATACAAAAAGAAATCAAAAATTGTTCTTTCAACATAACTGTTCTTTCAACATAACTGTTGTCACA
AATACGCCCTGTTCTACAGACTCGATGTGGTGGGTCCTAAAGTCACATTTGACCCTATTCCCATTCATTACTGTGCCCCGCTATTCTT
GTCTACAATCAAACAGGCCTGTCTCCTAAAGTCACATTTGACCCTATTCCCATTCATTACTGTGCCCCGCTATTCTT
AAATGCCAGACAAAAAATTAACGGAACAGGACCATGCAAGAAGTGTCTCAACAGTTCAATGCACTCATGAATTAAACCAGTCG
TTTCTACTCAACTCCTTCTCAATGGAAGCCTGGCAGAAGAGGAAATCATAATTGTACGAGACCTAATAATAACACAACAAAGT
AATCATCGTACAGCTGAACGAGACCATTGAAATAAATTGTACGAGACCTAATAATAACACAACAAAGT
GGACAGGCTTCTACGCCCACAGGACACATTATCGGAGAATATCCGCCAGGCTCAACTCTATTACAGTCCGCCAGGCTCAACTCTATTACAGT
TGCTTCAGAAGGTCAAAGCTCAGCTTCAACTGTCCCATGTGAAGATCAAACAAATCGTCAGAAGTGGCAGCGAGTCGGTCAAGCTAGTGTACGCCCCTCCAA
AACAACTCATTCCTTCACTCTCCATCTGTGAAGATCAAACAAATCGTCAGAAGTGGCAGCGAGTCGGTCAAGCTAGTGTACGCCCCTCCAA
TCGCCGGTAATATCACATGTAGAAGCAATATCACAGGGCTCTTGCTTCAAGGGACGCGCGGAACAACAACCGAAACCTTCAG
ACCAGGAGGAGGAGACATGCGAGACATGGGAGCTGAGCTGCTGTATAAAATATAAGATCGTAAAAATCAAACCAATCCAATTCTCTTAGAGCAA
CCAACTAGAGCCCAGCCCAGCCGTCCAGCTTACCGTCCCAGCTTACTGTGTATGGGGAATCAAACAACTGCAAGCAAGAGTATTGGCAGGTATCT
TCGAGGCCCAGCCGCCAGCTCATCTGCTCCCAGCTTACTGTGTATGGGGAATCAAACAACTGCAAGCAAGAGTATTGGCAGGTATCT
CAAGGACCAGCCAGCTTCTCTGGGAATTTGGGGTTGCAGCGAACAATATGACATGGGAGCGCGGAAAGAATATTCAGCAAATCTATT
AATAAGAGTTACAATGAAATCTGGACAATATGACAATGGGAGCGCGGAAAGAATGAGCAAGACCTCCTCGCCCCTGATAAATGGGCATCTCTGTGGAACTG
GTTTGACATAACTAAATGGTGGTGTGTAAAGATCTTACAA

Fig. 33A

CONSENSUS_01_AE-2003 (854 a.a.)
MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTTELRDKK
QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVV
STQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQA
MYAPPISGRINCVSNITGILLTRDGGANNTNETFRPGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKRRVVEREKRAVGIGAMI
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIIC
TTAVPWNSTWSNRSFEEIWNNMTWIEWEREISNYTNQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLWYIKIFIMIV
GGLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPERIEEGGGEQGRDRSVRLVSGFLALAWDDLRSLCLFSYHRLRDF
ILIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQELKISAISLLDATAIAVAGWTDRVIEVAQGAWRAILHIPRRIRQGLE
RALL
*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted as 140CF.

Fig. 33B

Con-AE01-2003 140CF.pep (638 a.a.)
Nick name: 008
MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTTELRDKK
QKVHALFYKLDIVQIEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVV
STQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEV
LKQVTEKLKEHFNNKTIIFQPPSGGDLEITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQA
MYAPPISGRINCVSNITGILLTRDGGANNTNETFRPGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKTLTVQARQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSTWSNRSFEEIWNNMTWIEWEREISN
YTNQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLW*
*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 33C

CODON-OPTIMIZED Con-AE01-2003 140CF.seq (1945 nt.)
Nick name: 008
ttcagtcgacagccaccATGCCGAGTCAAGGAAACACAAATGAACTGGCCTAATCTGTGGAAGTGGGCACCCTGATCCTGGTTT
GGTCATTATTGCTCTGCGAGCGACAATCTCTGGGTTACTGTCTATTACGGAGTCCCCGTTGGAGAGATGCCGACACTACACTG
TTCTGCGCCTCAGATGCCAAAGCTCATGAAACTGAAGTGCATAATGTTTGGGCAACCCACGCCTGTGTTCCTACCGACCCAAACC
CCCAAGAAATACACCTGGAAAACGTGACCGAGAACTTTAATATGTGGAAGAATAACATGGTTGAACAGATGCAAGAAGACGTAAT
CAGCCTGTGGGATCAAAGTCTGAAACCTTGCGTAAAACTGACTCCACTTTGCGTAACACTTAATTGCGTAACACTTAATATGACTACGA
AACGTTAACAACATCACTAACGTCTCCAACATCATCGGCAACATAACGAACGAAGTGAGAAATTGCAGTTTCAATATGACTACAG
AGCTCCGGGACAAGAAACAGAAGGTCCATGCTCTCTTTTACAAACTCGACATCGTCCAGATCGAAGACAATAACAGCTACAGACT
TATAAATTGTAATACATCCGTGATTAAACAAGCATGCCCCAAAATAAGCTTCGATCCTATTCCTATCCACTACTGTACTCCTGCC
GGCTATGCTATCTTGAAATGCAATGGACACCCAGCTGCTCCTGAACGCGGCTCTCTGGCAGAGGAAGAGATTATTATTCGAAGTGAGAACCTCAC
GCATTAAACCAGTGGTAAGCACTATCATCGTACATCTCAATAAATCAGTCGAAATTAATTGCACCGAGATATCAGTAATACTAGAACTTCA
ATCACTATCGGCCCAGGACAAGTCTTTTATAGAACAGAGAGATCATAGGAGAAGCGATATCAGAAAGGCATATTCAGCAATAATAAAACCATTATTTTTCAACCCCCAAG
CAAAATGAACGAAGTGACTCAAACAAGTCACCACCTTCAACTGCCGCGGCGAATTTTTTATTGCAATACCACTAAACTTTTCAACAAT
TGGCGGGAGACCTCGAAATCACTATGCCGGAAATGAGACCATGAGGGGCTGCAATGGAACAATCATACTCCCAAGATAAAACAAATCATTAACATGTGGC
ACGTTGCATCGGAAATGAGACCATGAGGGGCTGCAATGGAACAATCATACTCCCAAGATAAAACAAATCATTAACATGTGGC
AAGGTGCTGGACAAGCTATGTATGCCAATATCCGGTAGAATTAATTCGGTAGAATTAATTCCGACCAGCGGCGGCAACTGGCGGTCCGACTGCTCACTAG
AGACGGGAGGAGCAAATAATACAAATGAAACATTCCGACCAGCGGCGGCGCGCTAAGGACAACTGGCGGTCCGACTGCTCACTAG
TACAAAGTCGTACAGATCGAACCTCTTGGAATAGCACCGACTCGGCGCCCAACAACATCTGCTTCCTGGTCTCTCAGCTCACAGTTTGGGAATCAAGCA
GAATCGTACAGCAGCAATCCAACCTCTCCGCGCAATCGAGGCCCAACAACATCTGCTTCCTGGTCTCTGGGATGTTCTGGCAAAATAATC
GCTCCAGCGACCGTGCTCGCAGTGGAAAGATACCTGAAGGATCAGAAATTCCTTGGTCTCTGGGATGTTCTGGCAAAATAATC
TGCACTACCGCGGTTCCCTGGAATTCAACATGGAGCAACCGGAGTTTGAAGAGATATACGAAAATCCTCACCGAAAGCCAAAATCAGCAGGATCGCAACGAAAAAGACCT
AAAGGGAAATTAGTAACTAGTAACTATACGAACCAGATATACGAAAATCCTCACCGAAAGCCAAAATCAGCAGGATCGCAACGAAAAAGACCT
CCTCGAGCTTGATAAGTGGGCATCCCTTTGAACTGGTTCGACATCACAACATGGCTCTCGGTaaagatcttacaa

SUBSTITUTE SHEET (RULE 26)

Fig. 34A

Wild-type subtype A Env
00KE_MSA4076-A (Subtype A, 891 a.a),

MGAMGIQMNWQNLWRWGTMILGMLIICSVAEKSWVTVYYGVPVWRDAETTLFCASDAKAHDKEVHNVWATHACVPTDPNPQEMIL
ENVTEDFNMWKNSMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSDSNITSNSTKDSATLDMKSEIQNCSFNMTTELRDK
KQKVYSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIKP
VVTTQLLLNGSLAEEEVMIRSENITENAKNIIVQFKEPVQIICIRPGNNTRKSVHIGPGQAFYATGDIIGDIRQAHCNVSRELWN
KTLQEVATQLRKHFRNNTKIIFTNSSGGDVEITHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCRIKQIINM
WQRAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVGGNMRDNWRSELYKYKVKVEPLGVAPTKSRRRVEREK
RAVGLGAVFIGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLRDQQLLGI
WGCSGKLICTTNVPWNSSWSNKSLDEIWENMTWMQWDKEVSNYTQMIYNLLEESQNQQEKNEQELLALDKWANLWNWFNISNWLW
YIKIFIMIVGGLIGLRIVFAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEGGEQDRDRSIRLVSGFLALAWDDLRSLCL
FSYHRLRDFILIAARTLELLGHNSLKGLRLGWEGLKYLWNLLAYWGRELKISAISLVDSIALAVAGWTDRIIEIVQAIGRAILHI
PRRIRQGLERALI

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF design and the "W" underlined with red color is the last amino acid at the C terminus, and all the remaining amino acids after the "W" will be deleted in 140CF design.

Fig. 34B

00KE_MSA4076-A 140CF.pep (647 a.a)
Nick name: 011

MGAMGIQMNWQNLWRWGTMILGMLIICSVAEKSWVTVYYGVPVWRDAETTLFCASDAKAHDKEVHNVWATHACVPTDPNPQEMIL
ENVTEDFNMWKNSMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSDSNITSNSTKDSATLDMKSEIQNCSFNMTTELRDK
KQKVYSLFYRLDVVQINENSSDYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIKP
VVTTQLLLNGSLAEEEVMIRSENITENAKNIIVQFKEPVQIICIRPGNNTRKSVHIGPGQAFYATGDIIGDIRQAHCNVSRELWN
KTLQEVATQLRKHFRNNTKIIFTNSSGGDVEITHSFNCGGEFFYCDTSGLFNSSWTASNDSMQEAHSTESNITLQCRIKQIINM
WQRAGQAMYAPPIPGIIRCESNITGLILTRDGGEGNNSTNETFRPVGGNMRDNWRSELYKYKVKVEPLGVAPTKSRTLTVQARQ
LLSGIVQQQSNLLRAIEAQQHLLKLTVWGIKQLQARVLAVERYLRDQQLLGIWGCSGKLICTTNVPWNSSWSNKSLDEIWENMTW
MQWDKEVSNYTQMIYNLLEESQNQQEKNEQELLALDKWANLWNWFNISNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the deleted fusion cleavage site.

Fig. 34C

CODON-OPTIMIZED OOKE_MSA4076-A 140CF.seq (1972 nt.)
Nick name: 011

ttcagtcgacagccaccATGGGGCAGCCAATGGGAATCCAGATGAACTGGCAGAACCTCTGGCAGCACAATGATCCTGGGTAT
GCTCATCATCTGCTCTGTTGCAGAAAAGTCATGGGTAACAGTCTACTACGGCGTACCGGTGGCGGGGACGCCGAAACCACTCTC
TTCTGCGCCTCCGATGCCAAAGCACACGATAAAGAGAGTCCACAATGTTTGGGCTAACCCATGCGTGCCAACCGATCCTAACC
CACAGAGAAATGATACTCGAAAAGTTACTGAAGACTTCAACATGTTGGAAAAAATTCTATGGTTGAACAGATGCACACCGACATAAT
ATCACTGTGGGATCAGTCTGTCAAAATTGACCCCCCCTCTGCGTTACACTGAACTGTTCCGACTCAAATATCACT
TCTAATTCAACGAGCAATAGTAGTACGAAAGACTCCGCAACCCTGATATGAAAAGCGAAATACAGAAACTGTTCATTTAATATGACCA
CCGAACTGAGAGATAAAAAGCAGAAGAAGGTTTATTCTCTGTTCTATCGAATGGACGTGGTTCAGATTAACGAAAATAGCAGCGATTA
CCGACTCATTAACTGCAAATCAGCAATCACACAGGCTTGCCCAAAGGTAACATTTGAGCCAACATCCCTATTCACTACTGCGCC
CCTGCAGGATTTGCCATCCTGAAATGCAAACGATAAGAAGTTTAATGGGACACAGGACCCTGCTGAGAGAAGTCATGATTCGGTCTGAAAA
CCCACGGCATAAAACCTGTTGTTACCACAAATTGCTCAATGGATCAATTTCAGTTCAAAGAACCCGTCCAGATCATTTGCCTCAACACTCGC
CATCACTGAAAATGCCAAAAATATTATTATAGTTCAGTTGCAGGCTTTCTATGCAACCGGAGATATTATAGGCGACATCAGAGGCACACTCGA
AAGTCAGTCAGTTGTGGAACAAACTTGCAGGAAGTTGCTACTCAGCTGTAACTGTGGCGGAGAATTCTTCTATTGGGATACCTCTGGGCTC
GCCGGGAATTGTGGAACAAACTTGCAGGAAGTTGCTACTCAGCTGTAACTGTGGCGGAGAATTCTTCTATTGGGATACCTCTGGGCTC
TAATTCATCAGGCGGTGACGTGGAGATCAACGATTCAATGCAAGCAATGTAATAATATCACACTGCAGTGCCGAATTA
TTTAATTCCTCATGGACTGCTAGCAACGATTCAATGCAAGCAATGTAATAATATCACACTGCAGTGCCGAATTA
AACAAATCATCAATATGTGGCACCCGGTCAAGCAATGTAATTCTACAAACGAGACTTTCAGACCCGTAGGAGGCAATATGCGA
CACTGGCCTCATTCTGACCCCGACTCCGAACTTCTGGGAGTGGCACCCACCAAATCACGAACCCTGA
GACAATTGGCAGGCACGCCAACTTCTGAGCGAAGTGTATAAAATATAAAGTGGTGGAAGTAGTCCAACAGCAATCCAATCTTCTGAGAGCTATAGAAGCCTATAGAAGC
CTGTGCAGGCACGCCAACTTCTGAGCGAAGTAGTCCAACAGCAATCCAATCTTCTGAGAGCTATAGAAGCCCAGCAACACCTGCT
TAAACTTACGGTGTGGGGAATCAACAATTGCAGCGAACAATTGCACGACAAGAAGTTGAGACGATACTTGAGAGACCGATACTTGAGAGACCAACAACTCCTGGGA
ATCTGGGGATGTTCCGGTAAGTTGATTTGCACGACAAGAAGCGTTCCCTGGAACTCTTCCTGGTCAAACAAGAGTCTGGACGAAATAT
GGGAAAAATATGACAATGGATGGACCAAGAAGTTAGCAACTATACACAGATGATCTACAAACCTCCTGAAGAATCTCAGAA
TCAACAGGAAAAAAACGAACAAGAACTGCTCGCCCCTCGATAAGTGGGCTAACCTCTGGAACTGGTTTAATATTCAAACTGGTTG
TGGtaaagatcttacaa

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Fig. 35A

Wild-type subtype B
QH0515.1g gp160 (861a.a)

MRVKEIRRNCQRLRRWGTMLLGMLMICSATEQLMVTVYYGVPVWKEATTTLFCASDAKAYVTEKHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQKGEIKNCSFNITTGIRGRVQ
EYSLFYKLDVIPIDSRNNSNNSTEFSSYRLISCNTSVITQACPKISFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCT
HGIKPVVSTQLLLNGSLAEEVVIRSENFTNNVKSIIVQLNKSVVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
AQWNNTLKQIVIKLREQFGNKTIVFNQSSGGDVEIVMHSFNCGGEFFYCNSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIKQ
IVNMWQKVGKAMYAPPIRGQIRCSSKITGLILTRDGGTNGTNETETFRPGGGNMKDNWRSELYKYKVVKIEPLGIAPTKAKRRVV
QREKRAVGTIGAMFLGFLGAAGSTMGAASLTLTVQARLLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLRDQ
QLLGIWGCSGRLICTTNVPWNTSWSNRSLNYIWDNMTWMQWDREINNYTDYIYTLLEDAQNQQEKNEQELLELDKWASLWNWFDI
TNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSLQTHLPARRGPDRPEGIGEEGGERDRSVRLVHGFLALVWEDL
RSLCLFSYHRLRDLLLIVARTVEILGQRGWEALKYWWNLLLYWSLELKNSAVSLVDTIAIAVAEGTDRIIEIARRIFRAFLHIPT
RIRQGLERALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design

Fig. 35B

QH0515.1g 140CF (651a.a)
Nick name: 012

MRVKEIRRNCQRLRRWGTMLLGMLMICSATEQLMVTVYYGVPVWKEATTTLFCASDAKAYVTEKHNVWATHACVPTDPNPQEVVL
ENVTENFNMWKNNMVEQMHEDIISLWEQSLKPCVKLTPLCVTLNCTDKLRNDTSGTNSSSWEKVQKGEIKNCSFNITTGIRGRVQ
EYSLFYKLDVIPIDSRNNSNNSTEFSSYRLISCNTSVITQACPKISFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCT
HGIKPVVSTQLLLNGSLAEEVVIRSENFTNNVKSIIVQLNKSVVINCTRPNNNTRKSIHIGAGKALYTGEIIGDIRQAHCNLSR
AQWNNTLKQIVIKLREQFGNKTIVFNQSSGGDVEIVMHSFNCGGEFFYCNSTQLFNSTWNGNDTWNDTWKDTTNDNITLPCRIKQ
IVNMWQKVGKAMYAPPIRGQIRCSSKITGLILTRDGGTNGTNETETFRPGGGNMKDNWRSELYKYKVVKIEPLGIAPTKAKTLTV
QARLLLSGIVQQQNNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLRDQQLLGIWGCSGRLICTTNVPWNTSWSNRSLNYIWD
NMTWMQWDREINNYTDYIYTLLEDAQNQQEKNEQELLELDKWASLWNWFDITNWLW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 35C

CODON-OPTIMIZED QH0515.1g 140CF.seq (1984 nt.)
Nick name:012

```
ttcagtcgacagcaccaCCATGAGAGTAAAAGAAATCAGACGCCAACTGTCAGAGGTTGAGGAGATGGGGAACGATGCTCCTGGCAT
GCTGATGATTTGCAGTGCCACCGACGCAAAGCCTACGTAACAGAGAAAGCACAACGTGTGGGCCACACATGCATGCGTGCCAACAGATCCAAATC
TTTTGCGCGTCCGACGCAAAAGCCTACGTAACAGAGAAAGCACAACGTGTGGGCCACACATGCATGCGTGCCAACAGATCCAAATC
CTCAGGAAGTCGTTCTGGAAAATGTAACAGAAAATTTAATATGTGGAAAAACAATATGGTAGAGCAGATGCATGAAGATATCAT
CTCACTGTGGGAACAATCCTTGAAACCCTTGTGTCAAACTGACCCCACTTTGCGTAACACTTAACTGTTACTGATAAGCTTCGCAAT
GATACGTCCGGAACAACAAATTCAAGCAGCTGGGAAAAAGTGCAAAAGGGCGAAATCAAAAATTGTTCATTTAACATCACTACCGGTA
TCAGAGGGCGGGTACAGAGAATATTCTCTTTCTACAAACTCGACGTCATCCCAATCGAAATAACTCAAATAATAGCAC
AGAATTTAGTAGTTATCGCCTTATAAGCTGCAACACCAGCGTGATTACACAGCGTGCCCTAAAATCTCTTTGAGCCCATTCCT
ATTCACTACTGCGCACCAGCCGGCTTCGCCATCCTCAAATGTAACGACAAGAAATTTAACGAACCCGGACCCTGTAAGGAATGTGT
CCACCGTTCAATGCACTCATGGAAATCAAGCCCGTCGTTCTCTCCAACTTCTTCTCCAGCTTAATCATCGTCGTTATTAATGTTGTACAAGACCC
GATTCGCTCCGAAAATTTTACAAACAACCGAGAAAATCCATTCACATAGGGCCGGAAAGCTCTGTATACCGGGAAATTATTGGAGACATCAGAAGACAC
AACAATAACACCAGAAATCCATTCACATAGGGCCGGAAAGCTCTGTATACCGGGAAATTATTGGAGACATCAGAAGACAC
ACTGTTAACTTGAGTCGCGCCCAGTGGAACAACACATTCACATGAAATCGTAATGCAATGGACACAATGAAAAAAGTGGCAAGAGCTCAAAGACTAT
CGTGTTTAATCAGAGCTCCGGCCGGTGATGTCGAAATCGTAATGCAATGGACACAATGAAAAAAGTGGCAAGAGCTCAAAGACTAT
ACACAATTGTTAACAGACACCTGAAACGTAAATATGTGGCAAAAAGTGGGCAGGAGCACGAAACGAGACCTTCCGACCAGGAGGC
CGTGCAGAATAAAGCAAATCGTAAATATGTGGCAAAAAGTGGGCAGGAGCACGAAACGAGACCTTCCGACCAGGAGGC
TTCTTCCAAGATCACAGGTCTCGATACTCACAGCTGTCGAAATCGTAATGCAATGGACACAATGAAAAAAGTGGCAAGAGCTCAAAGACTAT
GGCAACATGAAGGATAACTGGAGAAGTGAACTTTACAAGTGGTCAAGATTGGTCAACAACAGAACAACCTTCTTAGAGCCATTGAAGACA
CTAAAAACACTCACCGTGCAGGCTAGATTGCTGCTTTCAGGGATAGTCCAACAAACAGTTGCAGGCCGCCGGGTTCTGCCTGGAATTAAACAGTTGGGGGAATTAAACAGTTGCAGGCCGCC
ACAAACACTCACCGTGCAGGCTAGATTGCTGCTTTCAGGGATAGTCCAACAAACAGTTGCAGGCCGCC
CAGCTTTTGGGTATCTGGGGGTGTTCAGGCCGGTGTTCAGGCCGTATCTTAGAGATCAG
TTAATTATATTTGGGACAATATGACAATGGATGCAATTAATAACTACACCGACTACATCTACACACTTCTGA
GGACGCCCAGAATCAGCAGGAGAACATGGATGCAATTAATAACTACACCGACTACATCTACACACTTCTGA
ACTAATTGGCTTTGGCATCACTGTGTGGAATTGGTTCGATATA
ACTAATTGGCTTTGGGTaaagatcttacaa
```

Fig. 36A

Wild-type subtype C
DU123.6 gp160 (854 a.a)
MRVKGIQRNWPQWWIWGILGFWMIIICRVVGNLWVTVYYGVPVWTEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEIVL
GNVTENFNMWKNDMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKVNATSNGTTYNNSIDSMNGEIKNCSFNITTEIRDK
KQKVYALFYRPDVVPLNENSSSYILINCNTSTTQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCHNVSTVQCTHGIKP
VVSTQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTKWN
TTLEKVKEKLKEHFPSKAITFQPHSGGDLEVTTHSFNCRGEFFYCDTTKLFNESNLNTTNTTLTLPCRIKQIVNMWQGVGRAMY
APPVEGNITCNSSITGLLLVRDGGNTSNSTPEIFRPGGGNMKDNWRSELYKYKVVEIKPLGVAPTKAKRRVVEREKRAVGIGAVL
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHMLQLTVWGIKQLQARVLAIERYLKDQQLLGLWGCSGKLIC
PTTVPWNSSWSNKSQTDIWDNMTWMQWDREISNYTGTIYKLLEESQNQQEKNEKDLLALDSWKNLWSWFDITNWLWYIKIFIMIV
GGLIGLRIIFGVLSIVKRVRQGYSPLSFQTLTPNPRGLDRLGRIEEEGGEQDKDRSIRLVNGFLALAWDDLRSLCLFSYHRLRDF
ILVAARAVELLGRSSLRGLQRGWEALKYLGNLVQYGGLELKRRAISLFDTIAIAVAEGTDRILEVILRIIRAIRNIPTRIRQGFE
AALL

Fig. 36B

DU123.6 140CF (638 a.a)
Nick name: 013
MRVKGIQRNWPQWWIWGILGFWMIIICRVVGNLWVTVYYGVPVWTEAKTTLFCASDAKAYEREVHNVWATHACVPTDPNPQEIVL
GNVTENFNMWKNDMVDQMHEDIISIWDQSLKPCVKLTPLCVTLNCTDVKVNATSNGTTYNNSIDSMNGEIKNCSFNITTEIRDK
KQKVYALFYRPDVVPLNENSSSYILINCNTSTTQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCHNVSTVQCTHGIKP
VVSTQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNESIEIVCTRPNNNTRKSIRIGPGQTVYATNDIIGDIRQAHCNISKTKWN
TTLEKVKEKLKEHFPSKAITFQPHSGGDLEVTTHSFNCRGEFFYCDTTKLFNESNLNTTNTTLTLPCRIKQIVNMWQGVGRAMY
APPVEGNITCNSSITGLLLVRDGGNTSNSTPEIFRPGGGNMKDNWRSELYKYKVVEIKPLGVAPTKAKTLTVQARQLLSGIVQQQ
**SNLLRAIEAQQHMLQLTVWGIKQLQARVLAIERYLKDQQLLGLWGCSGKLICPTTVPWNSSWSNKSQTDIWDNMTWMQWDREISN
YTGTIYKLLEESQNQQEKNEKDLLALDSWKNLWSWFDITNWLW***

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

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Fig. 36C

CODON-OPTIMIZED DU123.6 140CF.seq (1945 nt.)

Nick name: 013

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ttcagtcgacagccaccATGCCGCGCTAAAGGGGATTCAAAGAAATTGGCCGCCAATGGTGGTGGATTCTCGGGCTTTTGGAT
GATAATTATATGCCGCGGTTGTCGGAAATTTGTGGGTGACTGTGTACTACGGGGTGCCCGTGTGGACTGAGGCAAAGACCACCCTG
TTCTGTGCTAGCGATGCCAAAGCCTATGAACGCGAAGTGCACAATGTTGGGCTACCAATGTTTGGGCTACTACTGGGTGCCCTACCCCAAACC
CTCAGGAAAATAGTGCTCTCGGCAATGTAACGGAAAACTTCAACATGTGGAAAAATGATATGGTGGATCAGATGCACGAAGACATTAT
CTCAATCTGGGACCAAAGCCTGAAACCCTGCGTTAAACTGACTCTCCTCTCTCGCGTCACTCTCAATTGCACAGATGTCAAAGTGAAT
GCCACCTCAAACGTACGACAACTTACAACATTCTATTGACTCTCTATTGACTCTCTATTCCTTTAACATCACCA
CCGAGATACGCGACAAAAGCAGAAGGTCTATGCCCTTTTACCGCCCCGAAAGTTAGCTTTGATCCAATTCCTATACATTACTGCGCC
CATCCTCATCAACTGCAATACATCAACTGAAATGCAATAATAAGACTTTTAACGGGACCGGCCCATGTCAGAAGAAGAAATTATTATCCGCTCTGAGAA
CCCGCCGGCTACGCTATATCTGAAATGCCCCGTGGTCGTGTCCAACCCAGCTTGCAACCTTAATGAATCAATAGACATCGTGTACTCGGCCCAACAATAATACTAGA
TCTTACTAACAATGCAAAAACGATTATCGTGCACCTTAAGCAGTTACGCAACAGTTACGCAACATCGGGACCATCATCGGGGACATCGGGACGCCCATTGCAACATTT
AAAGCATTCGCATCGGACCTGGCCAGACAGTTTACGCAACAGTTTACGCAACATTTCCCTCTAAGGCGATCACGTTTCAACC
CTAAAACCAAGTGGAATACAACCCTGGAAGTCACAACAATACAACCACCAACCACTGTAACTGCCCCTGTAGAATCAAACAAATCGTAAACAATGTGGCAAGGGG
AATGAATCAAGTGGGGGAGACTTGGAAGTCACAACAATACAACCACCAACAATTTTTTATTGTGATACAACAAAACTTTTT
TTGGAAGGGCTATGTGTACGCTCCCCCCGTCGAAGGAAATATAACGTGTAACAGCAGAATATAACGTGTAACAGCAGCAATATGAAAGATAACTGGCGTCAGAACTGTACAAA
AGGCAATACTTCTAATTCAACTCCTGAAATTTCAACTCCTGAAATTTTAGGCCTGGCAATATGAAAGATAACTGGCGTCAGAACTGTACAAA
TACAAAGTTGTTGCAGCAACAGTCAAATCTCCCTGGGAGTCGCTCCAACAATCAAGTGCCTCCAACCAAAGCCCAACAGCCCAACAACAGTTCTTGGCCTCTGGGGGATTAAAACA
GCTTCAAGCCCCGCGTTGCCTTGGAATACTGGCCACAATCTTACAAACTCTTGGAGTAATAAATCACAGACCGATATTTGGGACAACATGACCTGGAAAACTCATC
ATAGGGGAAATTTCTAATTATACTGGCCACATAACTAAATTGGCTGGTGGTaaagatcttacaa
```

Fig. 37A

Wild-type subtype CRF01_AE
97CNGX2F-AE (854 a.a.)

MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWRNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTTELKDKK
QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVS
TQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSCRGEFFYCNTTKLFNNTCIGNTSMEGCNNTIILPCKIKQIINMWQGVGQAMY
APPISGRINCVSNITGILLTRDGGADNNTTNETFRPGGGNIKDNWRSELYKYKVVEIEPLGIAPTRAKRRVVEREKRAVGIGAMI
FGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIIC
TTAVPWNSSWSNKSFEEIWDNMTWIEWEREISNYTSQIYEILTESQNQQDRNEKDLLELDKWASLWNWFDITNWLWYIKIFIIIV
GSLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPEEIGEGGGEQSKDRSVRLVSGFLALAWDDLRSLCLFSYHLLRDF
ILIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQEIKISAISLLNATAIAVAGWTDRVIEVAQRAWRALLHIPRRIRQGLE
RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 37B

97CNGX2F-AE 140CF.pep (629 a.a.)
Nick name: 018

MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHL
ENVTENFNMWRNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANWTNSNNTTNGPNKIGNITDEVKNCTFNMTTELKDKK
QKVHALFYKLDIVQINSSEYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVS
TQLLLNGSLAEEEIIIRSENLTNNAKTIIVHLNKSVEINCTRPSNNTRTSITMGPGQVFYRTGDIIGDIRKAYCEINGIKWNEVL
VQVTGKLKEHFNKTIIFQPPSGGDLEIITHHFSCRGEFFYCNTTKLFNNTCIGNTSMEGCNNTIILPCKIKQIINMWQGVGQAMY
APPISGRINCVSNITGILLTRDGGADNNTTNETFRPGGGNIKDNWRSELYKYKVVEIEPLGIAPTRARTLTVQARQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSSWSNKSFEEIWDNMTWIEWEREISN
YTSQIYEILTESQNQQDRNEKDLLELDKWASLWNW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 37C

CODON-OPTIMIZED 97CNGX2F-AE 140CF.seq (1921 nt.)

Nick name: 018

ttcagtcgacagccaccATGCCAGTGAAAAGAGACACAAATGAATTGGCCCAATTGTGGAAGTGGGAACATTGATCCTGGACT
GGTGATAAATCTGTAGTGCATCCGACAATCTCTGGGTGACCGTTACTATGGTGTACCAGTTTGGAGAGACGCTGATACCACCCTC
TTCTGTGTGCAAGCGACGCCAAAGCCCACGAAACTGAAGTCCATAATGTATGGGCCACGCGTGCTACCAACCGACCCTAATC
CCCAAGAGATCCACCTTGAGAATGTAAACTGAGAATTTAACATGTGGAGAAATAACATGGTGGAACAAATGCAGGAAGACGTTAT
TTCCTTGTGGGACCAGAGCCTTAAACCTTGTGTCAAATTGACTCCCCTGTGTGACTCTCAATTGTACAAAACGCAAATTGGACC
AACAGCAACAACTACCAACGCCCTAACACAAAATTGGCAATATTACTGATGAAGTCAAGAACTGCACTTTAACATGACAACAG
AACTGAAGGAGGATAAGAAACAGAAAGTCCATGCTCTTCTATAAGCTCGACACAAATTCAGAATATAGACTGAT
AAACTGCCAATACTTCCGTATCAAACGATAAGAATTTAACGGCACAGAATTTCGATCCCTATTCACTACTGCACACCAGCCGGT
TACGCTATCCTGAAATGCAACGATAAGCACCAACTGCTCCTGGCCAAAGAGAGATCATCATTAGAAGTGAGAACCTGACGAA
TCAAGCCTATCCTGTAGTATCAACACAACTGTCCTCCTTCAATAAATCTGTAGAAAATCAACTCAAAACAACACTCGAACAAGTATA
CAACGCCAAGACTATAATAGTGCACCTCAATAAATCTGTAGAAAATCAACTCAAAACAACACTCGAACAAGTATA
ACAATGGGCCCTGGCCAAGTTTTTACCGGACCGGCGACAATAATAGGCGATATCAGAAAAGGCATATTGCGAGATCAATGGCATCA
AGTGGAACGAAGTACTACTGGTTTCAAGTAACTGGAAAAACTCAAAGACCATTTAATAAGACCATAATATTCCAGCCCCGAGTGGCGG
CGACCTCGAGATTATCACCCATCACTTTTCTTGTAGAGGCGAATTTTTTTTACTGTAACACGACCAAGCTCTTCAATAACACGTGC
ATCGGGAACACTTCTATGGAAGGATGTAATAATAACCATTATACTGCCCTGTAAGATCAAAATATCAACGGAGATTATCAACATGTGGCAGGGAG
TAGGTCAGGCAATGTACGCACCACCACTAACGAGACATTAGACCTGGAGGCGGCCAATATAAAGGATAATTGGAGAAGTGAGCTGTATAAA
AGGCGCAGACAACAATACCACTAACGAGACATTAGACCTGGAGGCGGCCAATATAAAGGATAATTGGAGAAGTGAGCTGTATAAA
TACAAAGTCGTAGAGATCGAACCCCTCGGCAATTGCTCCAACCCGGCCGGCCAACCCGGCGGCCAATATAAAGGATAATTGGAGAAGTGAGCTGTATAAA
GCATAGTCCAACAGCAGTCAAACCTCAAAACTGCTCCGGCGCTATTGAAGCAACAACACCTGCTCCAGCTGACTGTGTGGGAATCAAACA
ATTGCAAGCAAGAGTGCTCGCCGTGAACGCTATTTGAAAGATCAGAAATTTCTTGAACAAATCTGGGACAATGACGATTGAGTGGG
TGTACAACAGCGGTGCCTTGGAACTATACAAGCCAAATTTACGAAGAAATACTGACAGAAAGTCAAAACCAGCAGGACCAGAATGAGAAAGACCT
AGAGAGAGATTTCAAAACTATACAAGCCAAATTTACGAAGAAATACTGACAGAAAGTCAAAACCAGCAGGACCAGAATGAGAAAGACCT
GCTCGAACTGGATAAGTGGGGCCCTCTTTGTGTGGAACTGTGGtaaagatcttacaa

Fig. 38A

Wild-type DRCBL-G (854a.a.)

MRVKGIQRNWQHLWNWGILILGLVIICSAEKLWVTVYYGVPVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSPQEINMR
NVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNNSTRNITEEYRMTNCSFNMTTELRDKKAEYALFYR
TDVVPINEMNNENNGTNSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCVDKKFENGTGTCNNVSTVQCTHGIKPVV
STQLLLNGSLAEKDIIISSENISDNAKVIIVHLNRSVEINCTRPNNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
LRDVQAKLQEYFINKSIEFNSSSGGDLEITTHSFNCGGEFFYCNTSGLFNNSILKSNISENNDTITLNCKIKQIVRMWQRVGQAM
YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGGDMKNNWRSELYKYKTVKIKSLGIAPTRARRRVEREKRAVGVGAIF
<u>TTNVPWNTSWSNKSYNEIWENMTWIEWEREIDN</u>YTYHIYSLIEQSQIQQEKNEQDLLALDQWASLWSWFSISNWLWYIRIFVMIV
GGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLLHHQREPDRPAGIEEGGGEQDRDRSIRLVSGFLALAWDDLRSLCLFSYHRLRDF
ILIAARTVELLGRNSLKGLRLGWEALKYLWNLLLYWARELKNSAINLLDTIAIAVANWTDRVIEVAQRAGRAVLNIPRRIRQGLE
RALL

*Amino acid sequence underlined is the fusion domain that will be deleted in 140CF
design and the "W" underlined with red color is the last amino acid at the C
terminus, and all the remaining amino acids after the "W" will be deleted in 140CF
design.

Fig. 38B

DRCBL-G 140CF.pep (630 a.a.)
Nick name: 017

MRVKGIQRNWQHLWNWGILILGLVIICSAEKLWVTVYYGVPVWEDANAPLFCASDAKAHSTESHNIWATHACVPTDPSPQEINMR
NVTENFNMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTEINNNSTRNITEEYRMTNCSFNMTTELRDKKAEYALFYR
TDVVPINEMNNENNGTNSTWYRLTNCNVSTIKQACPKVTFEPIPIHYCAPAGFAILKCVDKKFENGTGTCNNVSTVQCTHGIKPVV
STQLLLNGSLAEKDIIISSENISDNAKVIIVHLNRSVEINCTRPNNNTRRSVAIGPGQAFYTTGEVIGDIRKAHCNVSWTKWNET
LRDVQAKLQEYFINKSIEFNSSSGGDLEITTHSFNCGGEFFYCNTSGLFNNSILKSNISENNDTITLNCKIKQIVRMWQRVGQAM
YAPPIAGNITCRSNITGLILTRDGGDNNSTSEIFRPGGGDMKNNWRSELYKYKTVKIKSLGIAPTRARTLTVVRQLLSGIVQQQ
SNLLRAIEAQQHLLQLTVWGIKQLRARVLALERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWENMTWIEWEREIDN
YTYHIYSLIEQSQIQQEKNEQDLLALDQWASLWSW*

*Amino acids seen in blue color is for easy identification of the junction of the
deleted fusion cleavage site.

Fig. 38C

CODON-OPTIMIZED DRCBL-G 140CF.seq (1921 nt.)
Nick name: 017

```
ttcagtcgacagccaccatgagagttaaaggagaatccaacgcgcaattggcaacacctttggaactgggcatattgattcttggact
ggtgataatttgtagcgctgaaaaactctgggtaactgtctattacggcggtcttattacacattgggccacccgactcgacgcccccctgttc
tggcgcaagtgatgcaagaaacgttaccagcactcacagcgacctgaatctcacacacatttgggccacccgactcgacgcccccctagtcctc
aggagatcaacatgagaaacgttaccagcactccgaaaatttaatatgtggaagaataatatggtggacaaatgcacgaagacataatttc
actctgggacgagtcttctgaaaccatgtgtgaaacttaccccccctgtgcgtcaacctgtaccctgcgagaactgccgagacaacaataactca
acgagaaatatcaacagaagaataccgaatgactaaccgatgttccttaatatgacaaccgaactgccgagacaaaaagaaggctgaat
acgcacttttctaccgaacagatgttgtaccaatcaacgagatgaacaatgaaaacaatgaaccaataccaattcactactgccgcaccccgcc
gacaaactgtaacgttagcacaatcaagcagccgcctaaagtcacattcgaacaattaaatgtatctacagtacaatgcacgcatg
ggattcgctattcttaagtgccgtggataagaagtttaacggaacctgcaataaatgtatctacagtacaatgcacgcatg
gaattaagcctgtcgttcaaccagttgctgctgaatgccctcagttgaaataaactgcactcggcctaataataacacagagcgctct
tgataatgcaaggtcatcatcgtccaacgctcaccaccgggagtatcggcgaaagcccactgcaacgttagctgga
gtcgcaatcggcccaggacaagctttttacactaccggggagttatcggcgacatacgggaaagcccactgcaacgttagctgga
ccaagtggaaatgaaaacactgcgcgatgttcaagccaaactcaagaactcaataaacaatgagttcaattctagctc
tggcgcggcgacctcgagattacaactacatttctgaaaataatgacacaactgaattctttattgtaatacctccggtctcttcttcaacaac
tctatcctcaaaagctatgtacgcccccaccatcgccggaaatataacgtgtcgatcaaatatcactggcctcatccttactagaga
gagtcggaggagacaataatagcacaccagcgagatattcagaccaggcgatatgaaaaacaactgactgtccaagtccgacagctcctgtccg
tacaaaaacagtcaacaacagtccaacttgctgcgcgctataagaggctcaacaacatctccttaagaccaacaactgacttcaaactga
aattgagagcaagacaaatgtaccctggaacggtatcttaaggactaaaaagttataatgaataacaatctcgaacaatctctcatcgaaactga
tgcacaacaaatgacacaattatacataccatatataccctctcgaacaatctctcatcgaaactgacatggaaatggg
aaagggaaattgacaacaagagtgctggccctggaacgcctggcgctggaacggtatcttaaggactaacaatctctcatcgaaactga
gttggctcttgaccaatgggcttctttgtgtgggagttggtaaagatcttacaa
```

2003 Centralized HIV-1 Envelope Proteins and the Codon-Optimized Gene sequences

Fig. 39A

2003 Cons Env

MRVMGIQRNCQHLWRWGILIFGMLIICSAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNTTNNEEIKNCSFNITTEIRDKKKKVYALFYKLDVVPIDDNNSYRLI
NCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENITNNAKTIIV
QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISRTKWNKTLQQVAKKLREHFNKTIIFNPSSGGDLEITTHSFNCGGE
FFYCNTSELFNSTWNGTNNTITLPCRIKQIINMWQGVGQAMYAPPIEGKIRCTSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRSELYKYK
VVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQLQAR
VLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMEWDKEINNYTDIIYSLIEESQNQQEKNEQELLALDKWASLWN
WFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPEGIEEGGEQDRDRSIRLVNGFLALAWDDLRSL
CLFSYHRLRDLILIAARTVELLGRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRVQRVCRAILNIPRRIRQGFERAL
L$

Fig. 40A

2003 M. Group.AnC Env

MRVMGIQRNCQHLWRWGILIFGMLMICSAAAENLWVTVYYGVPVWKEANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIVLENVTENI
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNSTNMGEIKNCSFNITTEIRDKKQKVYALFYRLDVVPINDNNSYRLJ
NCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENITDNAKTII\
QLNESVEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNISGAEWNKTLQQVAAKLREHFNNKTIIFKPSSGGDLEITTHSFNCGG
EFFYCNTSGLFNSTWNGTNETITLPCRIKQIVNMWQRVGQAMYAPPIAGNITCKSNITGLLLTRDGGTNNTETFRPGGGDMRDNWRSELYKY
KVVKIEPLGVAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAAQQHLLQLTVWGIKQLQA
RVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMQWEREISNYTDIIYSLIEESQNQQEKNEQDLLALDKWASLW
NWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPGGIEEGGEQDRDRSIRLVSGFLALAWDDLRS
LCLFSYHRLRDFILIAARTVELLGRRGWEALKYLWNLLQYWGQELKNSAISLLDTTAIAVAEGTDRVIEVVQRACRAILHIPRRIRQGFERA
LL$

Fig. 39B

2003 CON-S Env.seq.opt

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ATGCGCGTGATGGGCATCCAGCGCCAACTGCCAGCACCTGTGGCGCTGGGCATCCTGATCTTCGGCATGCTGATCATCTGCTCCGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGCACTGCACCAACGCCAACCTGACCAACGCCAACCTGACCAACGTGCCCGACATCACCAGCGGCATCACCGGCTGCAC
CCGAGATCCGCAACAACTCCGCCATCACCCAGGCTGTACGCCCTGTTCTACAAGCTGGACGTGGTGCCCATCGACGACAACAACACCTCTACCGCCTGATC
AACTGCAACACCTCCGCCATCAAGCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCCCCCGCCGGCTTCGCCAT
CCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCTCCCTGCGAGGAGAGATCATCATCCGCTCCGAGAACATCAGCGACAATCCGCAAGAACATCTCTACGC
CACCCCAGCTGCTGAACGGCTCCCTGGCCGAGATCAACTGCACCCGACATCAACCAGACATCTCCGGCGGCCACCCTGCAGCAGTGGCCAAGAAGC
TGCGCGAGCACTTCAACAAGACCATCATCTTCAACCCCTGTTCAACTGGGATCCAACACATCACCCTGCCCTGCCGCATCAAGCAGATCAT
TTCTTCTACTGCAACACCTCCGAGCTGTTCAACAACACCTGGAGGGCTGGGGCAACAACACCGAGAACCCCCCCGGCGGCGACCTTCAACTGCGGCGGCGAG
CCCGCGACGGCGGCAACAACACCGAGACCTTCCGCCCCCCCGGCGGCAACATGGGCGGCTCCAACATGGGCCAGCTGCTCCAGATCGAGAGGCCCATCGAGGCCCGCATC
GTGGTGAAGATCGAGCCCCTGGGCGTGGCGCCCCAAGGCGTGGGGCCGCCCTCCAACATGGGCGCCGCCCAGCTGCTGCTCCAGGCCATCGAG
GTTCCTGGGCGTTCCTGGGCGTGGGGCCGCGCTCCAACATGGGCGCCGCCCAGCTGCTGGGGGACACCGAGAGCGTGGGCCAGCTGCTGCTGCTGGGG
TGCAGCAGCAGTCCAACCTGGAGGGCCCATCGAGGCCCAGCTGCTGGGCATCGTGTGGGGGCATCTGCTGACCGTGTGGGGCATCTGCTGCTGCCAGGCCCCCG
GTGCTGGCCGTGGCCGTGCTACCTGAAGGACCGGGCTCCAACAAGTCCCAGGACGAGAGATCTGGGGACAACAATGACCTGGGGGACAACAAGGAGATCAACAACTACACCGACA
GAACTCCCTGGTCCAACAAGTCCCAGGACGAGAGTCCCAGAACACCCAGCAGGAGGAGCAGGAGCAGGAGGAGCAGCAGGAGCAGCAGCAGCAAACTGCCCCTGTGGAAC
TCATCTACTCCCTGATCGAGGAGGTCCCAGAACTGGCTGGTGTGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGGGGCCTCCTCCCGTGTTCGCCGTGCT
TGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGGGCCCTGGGCCTGATCGTGGGCGGCATCGGCGCCCGTGTTCGCCGTGCT
GTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTGGTGAACGGCTTCCTGGCCCTGGCCTGGGACCTGCTGGGGCGCCGCCGAGGGCA
TCGAGGAGGAGGGCGGCGAGCGGGACCGCGACCGCTCCATCCGCCTGGTGAACGGGCTGCTGGCCCTGATCTGGGACGACCTGCGCTCCCTG
TGCCTGTTCTCTTACCACCGCCTGCGCGACCTGCTGCTGATCGTGGCTGCGCGACTGGGCGCGCTCCATCCGCCACCACCGCCCATCTCCCTGCTGGGGGAGCGCTCCCTG
GTACCTGTGGAACCTGCTGCAGTACTGGGGCCAGGAGCTGAAGAACTCCGCCCGCCATCCTGCTGAACGCCCCCAGGGCTTCGCGCGCCGAGG
GCACCGACCGCGTGATCGAGGTGGTGCAGCGCGCTTCGAGGTGCGCGCCCATCAGGGCTTCGAGCGCGCCCTG
CTGTAA
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Fig. 40B

2003 M. Group.anc Env.seq.opt

Fig. 41A

2003 CON A1 Env

```
MRVMGIQRNCQHLLRWGTMILGMIIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYETEMHNVWATHACVPTDPNPQEIHLENVTEEF
NMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTTNTHEEEIKNCSFNMTTELRDKKQKVYSLFYRLDVVQINENNSNS
SYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVIIRSENITNNA
KTIIVQLTKPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRSEWNKTLQKVAKQLRKYFKNKTIIFTNSSGGDLEITTHS
FNCGGEFFYCNTSGLENSTWNNGTMKNTITLPCRIKQIINMWQRAGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDN
WRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQNEIWDNMTWLQWDKEISNYTHIIYNLIEESQNQQEKNEQDLLA
LDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSVINRVRQGYSPLSFQTHTPNPRGLDRPGRIEEGGEQGRDRSIRLVSGFLA
LAWDDLRSLCLFSYHRLRDFILIAARTVELLGHSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLVDTIAIAVAGWTDRVIEIGQRIGRA
ILHIPRRIRQGLERALL$
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Fig. 42A

2003 A1.AnC Env

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MRVMGIQRNCQHLLRWGTMIFGMIIICSAAENLWVTVYYGVPVWKDAETTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIDLENVTEEF
NMWKNNMVEQMHADIISLWDQSLKPCVKLTPLCVTLNCSNVNVTNNTNTHEEEIKNCSFNMTTELRDKKQKVYSLFYRLDVVPINENNSNS
SYRLINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVMIRSENITDNA
KTIIVQLTEPVKINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTEWNKTLQKVAAQLRKHFNNKTIIFNSSSGGDLEITTHS
FNCGGEFFYCNTSGLENSTWNNGTMKDTITLPCRIKQIINMWQRVGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNTNETFRPGGGDMRDN
WRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTV
WGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWLQWDKEISNYTDIIYNLIEESQNQQEKNEQDLLA
LDKWANLWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSVINRVRQGYSPLSFQTLTPNPEGPDRPGRIEEGGEQGRDRSIRLVSGFLA
LAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGRELKISAINLLDTIAIAVAGWTDRVIEIGQRICRA
ILNIPRRIRQGLERALL$
```

Fig. 41B

2003 CON A1 Env.seq.opt

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ATGCGCGGTGATGGGCATCCAGCGCAACTGCCAGCACCTGCTGCGCTGGGGCACCATGATCCTGGGCATGATCATCATCTGCTCCGCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGGTGCCCGTGTGGAAGGACGGCCGAGACCACCCCTTCTGCGCCTCCGACGCCAAGGCCTACGAGA
CCGAGATGCACAACGTGTGGGCCACCCACGCCTGCGTGCCGCCAACCCCCAGGAGATCCATCTCCCTGTGGGACCAGTCCTGAAGCCCTGGAAGCTGACCCC
AACATGTGGAAGAACAACATGTGAGCAGATGCACACCGACATCATCCTGAAGCGTGACCAACGTGACCAACAAACCAACAACTCCTTCAACA
CCTGTGCCTGACCCTGAACTGCTCCAACGTGACCAACGTGTACTCCCTGTTCTACCGCTGGACGTGGTGCAGATCAACGAACAACTCCAACTCC
TGACCACCGAGCTGCGCGACAAGAAGCAGAAGGTGTACTCACCCAGGCCTGCCCCAAGGTGTCTTCGAGCCCATCCCATCCTGCGCCC
TCCTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGCGTTCAACGGCACCGGCCCTGCCGAGGAGGAGTTCAAGAACGTGTCCAGTGCACCCCACGGCA
CGCCGGCTTCGCCATCCTGAAGTGCAAGCTGCTGAACGGCTCCCTGGCCGAGGAGTTCAACGGCACCGGCCCTGCCGAGGAGGAGTTCAAGAACGTGTCCAGTGCACCCCACGGCA
TCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGAATCAACAACACCCGCAAGTCCATCCGCATCGGCCCCGG
AAGACCATCATCGTGCAACCCGTGAAGATCAAGCCCGTGAAGATCAACTGCACCCGCCCCAACAACAATCAACACACCCGCAAGTCCATCCGCATCGGCCCCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCAAGAAGGCCCGTGTCCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGC
AGGTGGCCAAGCAGCTGCAGAGTTCTTCTACTGCAACATGTGGCAGCCCGGCAACAACAACGGCACCACCACCATCACCCT
TTCAACTGCCGGCGGAGTTCTTCTACTGCAACATCATCAACAAATGTGGCAGCCCGGCAACAACAACGGCACCACCACCATCACCCT
GCCCCTGCCATCAAGCAGCAGATCATCAACATGTGGCAGCGCGTGGTGGCCCCCATCAGGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGC
CCAACATCACCGGCCTGTTATCTGGCCCAGTCGTCGCAGCAGTCCGTGGCCCGTGCGCGCGAAGGATCCCAGAGGACCCCAGGACCCCAGGAA
TGGGCATCATCAAGCAGCTGCAGGCCCGCAGCTGCAGGCTGGGCGGCCGTTCCTGGCCCGTGCGCGCGAAGGATCCCAGAGGACCCCAGGACCCCAGGAA
GCTGATCTGCACCACCAAGTGCCCTGGAACTCCTCGTGTTCCAACAAGTCCCAGAACGAGATCTGGGACAACATGACCTGGCTGCAGTGGG
ACAAGGAGATCTCCAACTGTGAACTGCCCTGGAACTCCTCGTGTTCCAACAAGTCCCAGAACGAGATCTGGGACAACATGACCTGGCTGCAGTGGG
CTGGACAAGTGGGCCAACCTGTGAACTGGTTCGACATCTCCGTGCCGCCATCGAGCAGGCGCTACTCCCCGTGTTCCTTCCAGACCCACACCCCAACC
CGGCCTGCGCATCGTGTTCGCCCCGGCCATCGGCCCGCATCGAGGAGGAGGCCCTGAAGTACCTGTGGAACCTGCTGTCGTGTGCTGCGGCTTCCTGGCC
CCGCGGCCTGGACGACCTGCGCCTTCATCCTGTGTCCTGCCGCATCGAGGAGGAGGCCCTGAAGTACCTGTGGAACCTGCTGTCGTGTGCTGCGGCTTCCTGGCC
CTGGCCTGGGACGACCTGCGCCTTCATCCTGATCGTGTGGAACCTGCGTGTTGAACCTGCCGGCCATCGAGGACGCGCCGGCGCATCGGCGGCCGCCC
GGGCCACTCCTGGAAGGCCTGGGCCTGGAGGGCCTGAAGTACCTGTGTGTCGTGTTGAACCTGCCGGCCATCGAGGACGCGCCGGCGCATCGGCGGCCGCCC
ATCCTGCACATCCCCGCCGCCATCGGCCCCAGGGCCGCGCCCTGCTGTAA
```

Fig. 42B

2003 A1.anc Env.seq.opt
ATGGCGCGTGATGGGCATCCAGCGCAACTGCCAGCACCTGTGGGCGCTGGGCCACCATGATCATCTTCGGCATGATCATCATCTGCTCCGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGACGCCGAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGACCTCCCTGGGACCAGTCCTGAGGAGTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGCCGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCTCCAACGTGACCAACACCACCAACAACACCAACGGGGAGATCAAGAACTGCTCCTTCAACA
TGACCACCGAGCTGCGCGACAAGAAGCAGAAAGGTGTACTCCCTGTTCTACCGCCTGGACGTGGTGCCCATCAACGAGAACAACTCCAACTCC
TCCTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCCCC
CGCCGGCTTCGCCATCCTGAAGTGCAAGGACAAGGAGTTCAACGGCACAGGCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGCA
TCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGGCTCCCTGGCCGAGGAGGTGATGATCCGCTCCGAGAACATCACCGACAACGCC
AAGACCATCATCGTGCAGCTGAAGAATCCGTGAAGATCAACCACACCCCAAGTCCATCCGCATCGGCCCCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCTGCTGAACTGCAACAACTCCCTGAACCAAGTGTCCCGAGTGGAACAAGACCCTGCGAGA
AGTGGCGCCCAGCTGCGCAAGCACTTCAACAACAAGACCATCATCTTCAACCTCCACCTGTTCAACTCCACCTGGAACAACCATCACCACCCTCC
GCCCTGCCGCCGCAGTTCTTCTACTGCAACATGTGGCAGCCGTGGGCCAGTACGCCCCATCCCGGGCGGCGGCGACCTTCCGCGCCGGAGT
CCAACATCACCGGCCTGCTGACCCGCGACGGCGGCAACAACAACAACGAGACCTTCCGGCCGGCGGCGGCCAAGCGCCGGGCGGCGGCGA
TGGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGCGTGGCGCGCCTCAACCTGCTCGCGCCGCGAGC
GAAGCGCCGGCGGGTGGGGCGGGCGTGGGCGTCGTCGCAGCAGCTGCGAGGCGCCAGCAGCACCTGCTGGGGCATCTGACCGTG
AGGCCCCGGCCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGGCCGATCGTGGGCCGCCCCGGGGCGGCGGCCAA
TGGGGCATCAAGCAGCTGCAGGCCGCTGCGGGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCGGAGGAGCTGGGGCATCTGGGGC
GCTGATCTGCACCACCACCGCCGTGCCAACCTGGCCGTGCGGGGCTCCAACATCACCGACATCTCCAACTGGTCCAGTCTCCCCCTGAT
ACAAGGAGATCTCCAACATCCCAAGCTGTGGGAACTGCTGTACACCTGGTGCGGACGACCTGGGGCGGCCTGAT
CTGGACAAGTGGGCCAACCTGTGGAACTGGTTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGAT
CGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTCCCCACCGCGTGCCCTGGCCAGTCCGGGCCCTGGGGGCGCC
CGAGGCCCGGGACCGGCGACCTGCGCCTGTTCTCCTACCACCGCCTGCGCGACCTGCTGCTCATCCTGATCGTCCTCCTGGC
CTGGGCCTGGGGACGACCTCCTGCGGAAGGGCCTGGGAGGGGCTGGCCGCCTGGGCCCCGCCACCGTGTCCGGGCGAGCTGCT
GGGCGCGTCCTCCTGAAGGGCCTGGGGGCCTGGGAGGTGCCGCCTGGGCCCCATCCGCCATCGGCCTCAGGGGCCTGGAGGCTGCT
TCTCCGCCCATCAACCTGCTGGACACCATCGCCGTGCTGTCCTGGGGCCGCGAGATCGGACACCGCCGCATCTGCGCCGGCC
ATCCTGAACATCCCCCGCCGCATCCGCCAGGGCCTGGAGCGCGCGCTGCTGTAA

Fig. 43A

2003 CON A2 Env

MRVMGTQRNYQHLWRWGILILGMLLIMCKATDLWVTVYYGVPVWKDADTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVNLENVTEDFN
MWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCSNANTTNNSTMEEIKNCSYNITTELRDKTQKVYSLFYKLDVVQLDESNKSEYYYR
LINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCKDPRFNGTGSCNNVSSVQCTHGIKPVASTQLLLNGSLAEGKVMIRSENITNNAKNI
IVQFNKPVPITCIRPNNNTRKSIRFGPGQAFYTNDIIGDIRQAHCNINKTKWNATLQKVAEQLREHFPNKTIIFTNSSGDLEITTHSFNCG
GEFFYCNTTGLFNSTWKNGTNNTEQMITLPCRIKQIINMWQRVGRAMYAPPIAGVIKCTSNITGIILTRDGGNNETETFRPGGGDMRDNWR
SELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGMGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLKAIEAQQHLLKLTVWG
IKQLQARVLALERYLQDQQLLGIWGCSGKLICATTVPWNSSWSNKTQEEIWNNMTWLQWDKEISNYTNIIYKLLEESQNQQEKNEQDLLALD
KWANLWNWFNITNWLWYIRIFIMIVGGLIGLRIVIAIISVNRVRQGYSPLSFQIPTPNPEGLDRPGRIEEGGGEQGRDRSIRLVSGFLALA
WDDLRSLCLFSYHRLRDCILLAARTVELLGHSSLKGLRLGWEGLKYIWNLLLYWGRELKNSAISLLDTIAVAVAEWTDRVIEIGQRACRAIL
NIPRRIRQGFERALL$

Fig. 44A

2003 CON B Env

MRVKGIRKNYQHLWRWGTMLLGMLMICSAAEKLWVTVYYGVPVWKEATTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEVVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDMNATNTNTTIIYRWRGEIKNCSFNITTSIRDKVQKEYALFYKLDVVPIDND
NTSYRLISCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEVVIRSENFTD
NAKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHCNISRAKWNNTLKQIVKKLREQFGNKTIVFNQSSGGDPEIVM
HSFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNETEIERPGGGDM
RDNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQ
LTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNASWSNKSLDEIWDNMTWMEWEREIDNYTSLIYTLIEESQNQQEKNEQE
LLELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGLRIVFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEGGERDRSGRLVDG
FLALIWDDLRSLCLFSYHRLRDLLLIVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHI
PRRIRQGLERALL$

Fig. 43B

2003 CON_A2 Env.seq.opt

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ATGCGCGTGATGGGCACCCAGCGCCAACTACCAGCACCTGTGCGCTGGGCCATCCTGGCGCTGGGGCATCCTGGCCATGCTGATCATGTGCAAGGCCACCGA
CCTGTGGGTGACCGTGTACTACGGCGGTGCCCGTGTGGAAGGACGCCGACACCACCGACCCCAACCCCCAGGAGGTGAACCTGGAGAACGTGACCGAGGACTTCAAC
AGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCACGACCATCATCTCCCTGTGGGACCAGTCCCTGAAGCCTGGAGCTGACCCCCCT
ATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACACCATCAGCCTGTGGGACCAGTCCCTGAAGCTGGAGAACATCACCACCGAGC
GTGCGTGACCCTGAACTGCTCCAACGCCAACAACACCAACAACAACTGCTCCTACAACATCACCACCGAGCTGCGGGACGCCCTGAAGCCATCCC
TGCGCGACAAGAAGTGTTCTACAAGCTGACCCCCCTGCCCATCACCCAGCCTGCCCAAGGTGTCCTTCGAGCCCATCCCACTACTGCGCCCCGCGGCTT
CTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCACGGCAGTGCACCACCAACAAGCCATCAAGCCCG
TGGCCTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCGAGGCAAGGTGATGATCCGCTCCGAGAACATCACCAACACGCCAAGAACATC
ATCGTGCAGTTCAACAGCCCGGTGCCCATCATCCGCGACATCAACAACACCCAAGTCCATCCGCTTCGGCCCCACCTGCGCAGGCCTT
CTACACCAACGACCATCATCGGCGACATCCGCCCACTGCAACATCAACAAGACCAAGTGGAACCTGCCACCCTGCAGAAGGTGGCCGAGC
AGCTGCGCGAGCCACTTCCCCAACAAGACCATCATCTTCACCAAGAGACCTCCTCCGGCGCGGACCTGGAGATCACCAACACACCGCCC
GGCGAGTTCTTCTACTGCAACACCAGCCTGTTCAACTCCAACTCCACCTGGAAGAACGGCACCAACACCAACCCCCCATCGCCGGCGCGCTGCC
CTGCGCCGATCAAGCAGATCATCAACATGTGGCAGCGCGTGGGCCCATGTACGCCCCGCGGCGCGTGATCAAGTGCACCTCCA
ACATCACCGGCATCATCCTGACCCGCGAGACCAACCGCGGCAACAACAGAGACCATGGCCGGCGCAGCATGGCGCGACAACTGGCGC
TCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGGCGTGGCCCGCTCCACCATGGGCGCCGCTCCAACCCTGGTGGAGCGGAGAAGCG
CGCCGTGGGCATGGGCGCCGTGTTCCTGGGCTTCCTGGGCGCAGCAGCAGTCGTCGCGCCTGCGTGCCAACCTGCTGAAGCTGACCGTGTGGGGC
GCCAGCGTGCTGTCCGGCATCGTGCCGCGCCCGGCGCTGGCCGTTCAACCTGCTGAAGCTGACCGTGTCCCGGCAAGCTGAT
ATCAAGCAGCTGCCACCGTGCCCCTGGAACTCCTCGGTCCAACATCATCTACACAAGACCCAGGAGGAGATCTGGAACAACATGGAACAACATGGAACAAGG
CTGGCCGCCAACTCCAACTACACCAGACCTGCTGGTTCAACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGGAC
AGATCTCCAACTGTGGAACTGGTTCAACATCACCAACTGGGTTCAACATCAACCGCGCCTGCTGGTTCAACATCGTGGGCGGCCTGAGG
AAGTGGGCGCAACCTGTGCAAGTTCCTTCATGTGCGCCATCATCCGCCAACCGCGCGGAACCGCGCCTGTTCCTGCCTTCCTGGCCCTGGCC
GCCTGGACCGTGATCGGCCCCCGCGGCATCGTGCCTGCCGGCGAAGCGGCGGTTCCTTCCTGGGCCTTCCTGGGCCAGCCTGGGCCCACCGTGCTGGGCCCA
TGGGACGACCTGCGCTCTGTTCCTGTGGCCTTCCTGGGGCCTGGGCTGCTGCCGCCTGCCGCCTACCCGCCGCCTGCTGGGCCA
CTCCTCCCTGAAGGGCCTGGGCTGGGCTGCCCTGGGGAGGGCCTGGGCGGCCCTGGCCTGCCGGTGGTGGCTGGGCTGCTGGGCTG
CCATCCGCTGGCTGACAACCCATCCGCGCGCCAACCCATCCGCTGGCTGGACGGCTGGTTGGAACTGGGCGCGCGCCTGCTGAAGAACTCCG
AACATCCCGCGGCTTCGAGCGCCCATCCTGTAA
```

Fig. 44B

2003 CON_B Env.seq.opt

ATGCGCGTGAAGGGCATCCGCAAGAACTACCAGCACCTGTGGCGCTGGGGCCACCATGCTGCTGGGCATGCTGATGATCTGCTCCGCGCCGA
GAAGCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCGCAAGGCCTACGACA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGGTGGTGCTGGTGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGTGTGACCCTGAACTGCACCGACCTGAGGAACCGCACCAACAACAACAGCAGCGGCACCATGCTGGCCTGTGGCGGGAGATCAAGAACT
GCTCCTTCAACATCACCACCAGCATCCGCGACAAGGTGCAGAAGGAGTACGCCCTGTTCTACAAGCTGGACGTGGTGCCCATCGACAACGAC
AACACCTCCTACCGCCTGATCTCCTGCAACACCTCCGTGATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTG
CGCCCCCGCCGGCTTCGCCATCCTGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCCCCTGCCGCAACGTGTCCACCGTGCAGTGCACCC
ACGGCATCCGCCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCAGCCTGGCCGAGGAGGAGGTGGTGATCCGCTCCGAGAACTTCACCGAC
AACGCCAAGACCATCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGTCCATCCACATCGG
CCCCGGCCGCGCCTTCTACACCACCGGCGAGATCATCGGCGACATCAGGCAGGCCCACTGCAACCTGTCCCGGGCGGGCACCCGAGATCGTGATG
TGAAGCAGATCGTGAAGAAGCTGCGCGAGCAGTTCGGCAACAAGACCATCGTGTTCAACCAGAGCTCCAGCGGCGGAGAGGGCACCCGAGGGG
CACTCCTTCAACTGCGGCGGCGAGTTCTTCTACTGCAACACCAGCCAGCTGTTCAACCAGGTGGCAGGAGGTGGCAAGGCCATGTACGCGCCCCCAGA
CAACAATCACCCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGAGGTGGGCAAGGCCATGTACGCCCCCCATCGAGATCAAGCCCCTG
TCCGCTGCTCCTCCCAACATCACCGGCCTGCTGCTGACCCGCGACGGGTGGTGACAAGTTCTGGGCGCCCCCAGCGGCCAAGCGCCGGCGTGGT
CGGCGACAACTGGCGCGGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCTTCCTGGGGCGCAGCAGGGCCCCAGCACCTGCTGCGCCAG
GCAAGCGCGAGAAGCGCGCCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGCAG
TGACCGTGTGGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGAGGTGACCCTGGTCCAACATGACCTGGA
CTGCTGGAGCTGGACAAGTGGGCCTCCCTGGGAGAACTGCTTCAAGATCTTCATCATGACCGGGGGTGGGG
CGGCCTGGTGGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCGCCT
TGCCCGCCCCCCCGGCGCCCCCGACCGCGGGGGCATCGAGGGAGGAGGCGCGCGAGAGGCCTCCGGCGCTCCGGTGGGGACGGGC
TTCCTGGCCCTGATCTGGGACGACCTGCGGAGGTGCTGGGGAGGTGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGTCCCAGGAGCTGAAGAACTCCGCCGTGT
GGAGCTGCTGGGGGAGGTGCTGGGGAGGTGGGGCGTGGCCGTGATCGCCGCACCGACGGTGGTGCAGCGCGTGATCGAGGTGGTGCAGCGGCCTGCCGCGCCATCGT
CCTGCTGGACCGCCGGGGGCTGGGGGGCGCTGGGCAGGGGTGGGGCCATCGCCGCCACCGGCGCTGGGGGCCTGCGGGGAGCTGAAGAACTCCGCCGTGT
CCCCGCCGCCATCCGCGCCATCCGCCAGGGCCTGGAGCGCGCCCTGCTGTAA

Fig. 45A

2003 B.anc Env

MRVKGIRKNCQHLWRWGTMLLGMLMICSAAENLWVTVYYGVPVWKEATTLFCASDAKAYETEVHNVWATHACVPTDPNPQEVVLENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLLNATNTNSTNMYRWRGEIKNCSENITTSIRDKMQKEYALFYKLDVVPIDNN
TSYRLINCNTSVITQACPKVSFEPIPIHYCTPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIRPVVSTQLLLNGSLAEEEVIRSENFTDN
AKTIIVQLNESVEINCTRPNNNTRKSIHIGPGRAFYATGEIIGDIRQAHCNLSRAKWNNTLKQVTKLREQFDNKTIVFNPSSGGDPEIVMH
SFNCGGEFFYCNTTQLFNSTWNGTWNNTEGNITLPCRIKQIINMWQEVGKAMYAPPIRGQIRCSSNITGLLLTRDGGNNETEIFRPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQL
TVWGIKQLQARVLAVERYLRDQQLLGIWGCSGKLICTTTVPWNASWSNKSLDEIWNNMTWMEWEREIDNYTGLIYTLIEESQNQQEKNEQEL
LELDKWASLWNWFDITNWLWYIKIFIMIVGGLVGLRIVFAVLSIVNRVRQGYSPLSFQTRLPAPRGPDRPEGIEEEGGERDRSGRLVNGF
LALIWDDLRSLCLFSYHRLRDLLLIVARIVELLGRRGWEALKYWWNLLQYWSQELKNSAVSLLNATAIAVAEGTDRVIEVVQRACRAILHIP
RRIRQGLERALLS

Fig. 46A

2003 CON C Env

MRVRGILRNCQQWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTTLFCASDAKAYEKEVHNVWATHACVPTDPNPQEIVLENVTENF
NMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEIKNCSFNITTELRDKKQKVYALFYRLDIVPLNENNSYRLINC
NTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFNGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENLTNNAKTIIVHL
NESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEDKWNKTLQKVSKKLKEHFPNKTIKFEPSSGGDLEITTHSFNCRGEF
FYCNTSKLFNSTYNSTNSTITLPCRIKQIINMWQEVGRAMYAPPIAGNITCKSNITGLLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKV
VEIKPLGIAPTKAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNNLLRAIEAQQHMLQLTVWGIKQLQTRV
LAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEDIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEKDLLALDSWKNLWNW
FDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEEGEQDRDRSIRLVSGFLALAWDDLRSLC
LESYHRLRDFILIAARAVELLGRSSIRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQ
GFEAALQS

Fig. 45B

2003 B.anc Env.seq.opt

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ATGCGCGTGAAGGGCATCCGCAAGAACTGCCAGCACCTGTGGCGCTGGGGCACCATGCTGCTGGGCATGCTGATGATCTGCTCCGCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCGCCAAGGCCTACGAGA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCCTGCTGCGTGCCACCCAACCCCAGGAGGTGGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACAGATGCGACCTGCTGCCTGGCGGCGAGATCAAGAACT
CCTGTGCTGACCCTGAACCTGACCCTGAAGGTCCAACACCAACTCCAACAACAACTCCAACAACATGTACCGCTGGCGCGGCGACCTGGCC
GCTCCTTCAACATCACCACCTCAACTGCAACTCCGCGACAAGATGCAGAAGGAGTACGCCCTGTTCTACAAGCTGGTGCCCATCGACAACAAC
ACCTCCTACCGCCTGATCAACTGCAACACCTCCGTGATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCAC
CCCCGCCGGCTTCGCCCTGACCTCCGAAGTGCAACGACAAGAAGTTCAACGGCACCGGCTCCCTGGCCGAACGGCTGAACGTGTCCGGCACCCACG
GCATCCGCCCGGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCGTGGCTGAACGGCGAGTCCGTGACGGCTGAACCAACTTCACCGACAAC
GCCAAGACCATCATCGTGCAGCTGAACGAGTCCGTCGAGAGCCATCCCGGCCGAACACCGCCAAGTCCATCCACATCCGGCCC
CGGCCGCGCTTCTACGCCCACCGGCCGAGATCATCGGCGACATCCGCCAGGCCCACTGCAACCCTGTCCCGGCGACCCCGAGATCGTGATGCAC
AGCAGGTGGTGACCAAGCTGCGCGAGTTCTTCTACTGCAACAACACCACCCAGCTGTTCAACTCCAACCTGGAACAACAACACCCCTGA
TCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACAGCATCAAACATGTGGCAGGGCCATGGCAACGAGACCGAGATCTTCCGGCGCGCGGCGCAA
CATCACCCTGCCCCTGCCCCAACATCAACCGGCCTGCTCCTGAACCTGCCCGGCGCGCCATGTTCCTGGGCGCTTCCTGGGCGCCAGATCC
GCTGCTGCTCCTCCAACATCACCCGGCCTGAAGTGGTGAAGTACAAGGTGGTGAAGATCGAGCCCCTGGGCGCCAAGGCGCCGGTGGTGCA
GACAACTGGCGCGCTCCGAGCTGTGGGCGCTCCTGTGTCCGGCCATGTTCCTGGGCGCATCGTCCGGCCAGCTGCTGCGCGCCGGTGGTGCA
GCGCGAAGCGCCGCCCAGCTGCTGTGGGCATCGGCCCGTCCAGCCTGCAGCAGAACAACCTGCTCGAGGCCCAGCAGCACCTGCTGCAGCTG
CCGTGCAGGGCGCATCAGCAGCTGCAGCAGCCGCCGTCCAGCCTGCCCGTGCTGCGCCTGTCGGCCCATCGGGCATCTGGGGCTGCTC
ACCGTGTGGGGCATCAAGCAGCTGCACCACCGTGCCCCTGGCCGTGATCTGCACCAACTACACCGACCTGCCGATCTGGAACAACATGACCTGGATGG
CGGCAAGCTGATCTGCACCACCCTGGGCGGAGCTGCGAGATCGGCGAGATCTGGACAACATGAGCAGGAGGAGAACGAGCAGGAGCTG
AGTGGGAGCTGACAAGTGGCGAGATGGCCTGCTCCCTGTGGAACTGGTTCGACATCAACCAACTGGCGTGGTACATCAAGATCTTCATCATGATCGTGGGCGG
CTGGGAGCTGACAAGTGGCGAGATGGCCTGCTCCCTGTGGAACTGGTTCGACATCAACCAACTGGCGTGGTACATCAAGATCTTCATCATGATCGTGGGCGG
CCTGGTGGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACAGCCCGCTGTCCTTCCAGACCCGCCTGCCGC
CCGCCCCCGCGCGACCCGCATCGAGGAGCCCGAGCGCGAGGAGGGCGGCGAGCGCGACCGCGACCGCTGCGCCCTGCTGGTGCCGCATCGTGGA
CTGGCCCTGATCTGGGACGACCTGCGCTCCCTGTGCCTGTTCTCCTACCACCGCCTGCGCGACCTGCTGCTCAGCTGTACTGGGAACTGCTGGAA
GCTGCTGCTGAACGAGGCCACCGCGCCCATCCGTAGCTCCCTGGAGGCCGTGGCCCGTGGGCTGGTGAACGCTGAAGCTGAACGGCGGCTTCGAGGTGGCGGTGTCCTGGTGGAACGTGCTGCAGTACTGGGGCCAGGAGGTGGTGCGTGATCGTGAACGGCGTGCAGTACTGGGGCCAGGAGGTGGTGCGTGATCGTGAAGCGCTGAAGAACTCCGCGCCGCTGCGCCATCCCGCCGTCCC
CGCCGCATCCGCCAGGGCCTGCAGCGGCGCGCGCCCTGCTGTAA
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Fig. 46B

2003 CON_C Env.seq.opt
ATGCGCGTGCGCGGCATCCTGCGCAACTGCCAGCAGTGGTGGATCTGGGCATCCTGGGCTTCTGGATGCTGATGATCTGCAACGTGGTGGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGA
AGGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGAATGCCCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACGACGACATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGTCTTCAAGATGCTCCTTCAACATCACCACCGAGC
CCTGTGTGCGTGACAAGAAGCAGAAGGTGTACGCCCCTGTTCTACCGCCCCGGTGTCCTCCAAGGTGTCCTTCGACCCCCCATCCCCATCCCCACTACTGCGCCCACCGA
TGCCGACAAGAAGCAGAAGGTGTACGCCCCTGTTCTACCGCCCCGGTGTCCTCCAAGGTGTCCTTCGACCCCCCATCCCCATCCCCACTACTGCGCCCACCGA
AACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGACCCCCCATCCCCATCCCCACTACTGCGCCCACCGA
GTGCAACAACAAGACCTTCAACGGCCTCCCTGCAACAACGTGTCCACCGTGCAGTCCATCCGCGGCCAACAACGCCCCGCCCCGGCATCAAGCCCGTGGTGTCCACCCG
AGCTGCTGCTGAACGGCTCCCTGGCCGAGAATCATCATCAACAACAACCTGACCATCGCCCCGCCCCGGCATCAAGCCCGTGGTGTCCACCCG
AACGAGTCCGTGGAGATCGTGCTGCACCCGCCTGGCACCCCAAGCTGCAGTCCATCCGCGGCCAACAACGCCCCGCCCCGGCATCAAGCCCGTGGTGTCCACCCG
CGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCGAGGACAAGAGTGGAACAAGACCCTGCAGAAGGTGTCCAAGAAGCTGAAGG
AGCAATCATCCCCAACAAGACCATCAAGTTCGAGCCTTCAACTCCAACTCCACCACCATCACCCTGCCCGCCAGCATCAAGCAGATCATCAA
TTCTACTGCAACACCTCCAAGCTGTTCAACTCCAACTCCACCACCATCACCCTGCCCGCCAGCATCAAGCAGATCATCAA
CATGTGGCAGGAGGTGGGCCGCGCCATGTACGCCCCCCCCCCCGGCGGCGGGGGGATCAAGCCCCTGCAAGTCCAGTGCTGCTGCTGACCCC
GCGACGCGGCAAGAACAACACCGAGACCTTCCGCCCCGGCGGCGGGGACAACTCCGAGCTGTGTACAAGTACAAGGTG
GTGGGAGATCAAGCCCCTGGGCATCGCCCCGGCATCCTGGGCAGCGAGGCCCGCCCCGTGGGGCCGTGGGGCCGTGTT
CCTGGGCGCCGAGCTGCTGCAGCGCCCGCCATCCGAGGGCCATCGAGGGCCATGTGGGGCATCTGCTGTTGGGGCATCGTGC
AGCAGCAGTCCAACCTGCTGCGCGCCCCTGGGCGTGGGGCATGTGGGGCATCTGCTGTCCGGCAGCTGAAGCAGCCCGGCGTG
CTGGCCATCGAGCGCTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACCACCGCCGTGCCCTGGAA
CTCCTCCTGGTCCAACAAGTCCCAGGAGGACATCTGGGACAACATGACCTGGATGCAGTGGGACAAGGAGATCGACAACTACACCGACACCA
TCTACCGCCTGCTGGAGGACTCCCAGAACCAGCAGGAGAAGAACGAGAAGGACCTGCTGGCCCTGGACTCCTGGAAGAACCTGTGGAACTGG
TTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTCTTCGCCGTGCTGTC
CATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTGTCCTTCCAGATCCTGCTGGCCCTGCCCCGCCTGCGGCCTCCCTGTGC
AGGAGGAGGGCGGCGAGCAGGACCGCGACCGCTCCATCCGCCTGGTCCCGCGCCGTGGGCCTGCTGGGGCCTCCCTGTGC
CTGTTCTCCTACCACCGCCTGCGCGACTTCATCCTGATCGCCGCCCGCGCCGTGGGCCTGCTGGGGCCTCCCTGTGC
CGGCTGCGGGGCTGGGAGGCCCTGAAGTACCTGGGCAACCTGGTGCAGTACTGGGGCCTGGAGCTGAAGAAGTCCGCCCGCAACCTGCTGGACACCATCGCGAGGGGCACCGACGCCAGCTGATCTGGGGACCGTGTTGGGGAGGGGGCGGGGGGGGCAGGGGGGGGGGGGCCTGCAGTCCCGCGGCACCGACGCCAGCTGATC
CCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTGTCCTTCCAGATCCTGCTGGCCCTGCCCCGCCGCATCCGCCAAGATCCCCGCGCATCCGCAGTAA
GGCTTCGAGGGCCGCCCCTGCAGTAA

Fig. 47A

2003 C.anc Env

MRVMGILRNCQQMWIWGILGFWMLMICNVVGNLWVTVYYGVPVWKEAKTLFCASDAKAYEREVHNVWATHACVPTDPNPQEMVLENVTENF
NMWKNDMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTNATNATNTMGEMKNCSFNITTELRDKKQKVYALFYRLDIVPLNDNNSYRLINC
NTSAITQACPKVSFDPIPIHYCAPAGYAILKCNNKTFENGTGPCNNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIRSENLTDNAKTIIVHL
NESVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISEEKWNKTLQRVGEKLKEHFPNKTIKFAPSSGGDLEITTHSFNCRGEF
FYCNTSRLFNSTYNSKNSTITLPCRIKQIINMWQGVGRAMYAPPIAGNITCKSNITGLLLTRDGGKNNTETFRPGGGDMRDNWRSELYKYKV
VEIKPLGIAPTEAKRRVVEREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEAQQHMLQLTVWGIKQLQTRV
LAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQEEIWDNMTWMQWDREISNYTDTIYRLLEDSQNQQEKNEQDLLALDSWENLWNW
FDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTLTPNPRGPDRLGRIEEGGEQDRDRSIRLVSGFLALAWDDLRSLC
LFSYHRLRDFLLIAARAVELLGRSSLRGLQRGWEALKYLGSLVQYWGLELKKSAISLLDTIAIAVAEGTDRIIELIQRICRAIRNIPRRIRQ
GFEAALL$

Fig. 48A

2003 CON_D Env

MRVRGIQRNYQHLWRWGIMLLGMLMICSVAENLWVTVYYGVPVWKEATTLFCASDAKSYKTEAHNIWATHACVPTDPNPQEIELENVTENF
NMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVKRNNTSNDTNEGEMKNCSFNITTEIRDKKQVHALFYKLDVVPIDDNNSNT
SYRLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCKDKKFENGTGPCKNVSTVQCTHGIRPVVSTQLLLNGSLAEEIIRSENLTNNA
KIIIVQLNESVTINCTRPYNNTRQRTPIGPGQALYTTRIKGDIRQAHCNISRAEWNKTLQQVAKKLGDLLNKTIIFKPSSGGDPEITTHSF
NCGGEFFYCNTSRLFNSTWNNTKWNSTGKITLPCRIKQIINMWQGVGKAMYAPPIEGLIKCSSNITGLLLTRDGGANNSHNETFRPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAIGLGAMFLGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNLLRAIEAQQHLLQL
TVWGIKQLQARILAVERYLKDQQLLGIWGCSGKHICTTTVPWNSSWSNKSLDEIWNNMTWMEWEREIDNYTGLIYSLIEESQNQQEKNEQEL
LELDKWASLWNWFSITQWLWYIKIFIMIVGGLIGLRIVFAVLSLVNRVRQGYSPLSFQTLLPAPRGPDRPEGIEEGGEQGRGRSIRLVNGF
SALIWDDLRNLCLFSYHRLRDLLLIAARIVELLGRRGWEALKYLMNLLQYWIQELKNSAISLFDTTAIAVAEGTDRVIEIVQRACRAILNIP
TRIRQGLERALL$

Fig. 47B

2003 C.anc Env.seq.opt
ATGCGCGTGATGGGCATCCTGCCCAACTGCCAGCAGTGGTGGATCTGGGCATCCTGGGCTTCTGGATGCTGTGATGATCTGCAACGTGGTGGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGC
GCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATGGTGCTCCCTGGGGACCAGTCCTGGAAGCCCTGACCCC
AACATGTGGAAGAACGACGACATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCCG
CCTGTGCGTGACCCTGAACTGCAACGACCTGAACGCCACCAACACCACCAACGCCAGCCCCACCATGGGCGAGATGAAGAACTGCTCCTTCAACATCACCACCGAGC
TGCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGGACATCGTGCCCCTGAACGACAACTCCTACCGCCTGATCAACTGC
AACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGACCCCATCCCCATCCACTACTGCGCCCCCGCCGGCTACGCCATCCTGAA
GTGCAACAACAAGACCTTCAACGGCACGGCTCCCCTGCCCGAGGAGGAGATCATCATCCGCTCCGAGAACCTGACCGACAACGCCAAGACCATCATCGTGCACCTG
AGCTGCTGCTGAACGGCTCCGTGGAGATCGTGTGCACCCGCCCCAACAACAACACCCGCAAGTCCATCCGCATCGGCCCCAGACCCTGTACGCCTCACGGCCACCGG
AACGAGTCCGTGGAGATCGTGTGCACCCGCCCCAACAACAACACCCGCAAGTCCATCCGCATCGGCCCCAGACCCTGTACGCCGAGAAGCTGAAGG
CGACATCATCGGCGACATCCGGCCCAGCCCACTGCTTCAACTGCCGCGGCGAGTTC
AGCAACATCCCCAACAAGACCATCAAGTTCGCCCCCTCCTCCGGCGGCGACCTGGAGATCACCATGCACTCCCCGCGGCGAGATCATCAA
TTCTACTGCAACACCTCCCGCCTGTTCAACTCCACCTGGTTCCCCAACGGCACCTGGAACCTGAACGAGTCCAACAGCACCGAGAGCAACATCACCCTGCCCTGCCGCATCAAGCAGATCATCAA
CATGTGGCAGGGCGTGGGCCGCGCCATGTACGCCCCGCCCATCGCCGGCAACATCACCTGCAAGTCCAACATCACCGGCCTGCTGCTGCTGACCCC
GCGACGGCGGCAAGAACAACACCGAGACCTTCCGCCCCGGCGGCGGCAACATGCGCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTG
GTGGAGATCAAGCCCCTGGGCGTGGCCCCTACCCCGTGTT
CCTGGGCTTCCTGGGCGCCGCCGGCTCCACCATGGGCGCCGCCTCCATCACCCTGACCGTGCAGGCTCGGCCATCGTGCGTGCCCATCGTGC
AGCAGCAGTCCAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGGGCCTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTG
CTGGCCATCGAGCGCTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACCACCGCCGTGCCCTGGAA
CTCCTCCTGGTCCAACAAGTCCCAGGAGGAGATCTGGGACAACATGACCTGGATGCAGTGGGACAAGGAGATCTCCAACTACACCGACACCA
TCTACCGCCTGCTGGAGGACTCCCAGAACCAGCAGGAGAAGAACGAGCAGGACCTGCTGGCCCTGGACTCCTGGAAGAACCTGTGGAACTGG
TTCGACATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTC
CATCGTGAACCGCGTGCGCCAGGGCTACTCCCCGCTGTCCTTCCAGACCCTGGTGCCCGGCCCCCGCGGCCCTGGACCGCCTGGGCCGCATCGAGGAGGGCCTGCTGGCCCTGTGCC
AGGAGGGCGTGCTGGCCCTGGCCCAGCTGGGCCTGGCTGGCCTGCGCGACTTCATCCTGATCGTGGCCAGGTACTGGTGGAACCTGCTGCAGTACTGGTCCCAGGAGCTGAAGAACAGCG
CTGTTCTCCTACCACCGCCTGCGCGACTTCATCCTGATCGTGGCCCGCGCCGTGGAGCTGCTGGGCCGCCGTGGGCCTGGAGAGCTGAAGAACAGCGCCGTGAGCCTGCTGAACGCCACCGCCGTGGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGTGGTGCAGGGCGCCTGCCGCGCCATCCGCCACATCCCGCGCCGCATCCGCCAGGGCCTGGAGCGCGCCCTGCTGTAA
GGCTTCGAGCGGCCCGCCCTGCTGTAA

Fig. 48B

2003 CON_D Env.seq.opt

ATGCGCGTGCGCGGCATCCAGCGCCAACTACCAGCACCTGTGGCGCTGGGCGCATCATGCTGCTGGGCCATGCTGATGATCTGCTCCGTGGCCGA
GAACCTGTGGGTGACCGTGTACGGCGTGCCCGTGGAAGGAGCGCCACCACCACCCCAGCCCCGACCCCGTTCTGCGCTCCGACGCCAAGTCCTACAAGA
CCGAGGCCCACAACATCTGGGCCACCCACGCCTGCGTGCCCAGCGAGATCGAGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCCC
CCTGTGCGTGACCCTGAACTGCACCGACGTGAAGCGCAACGAGGGCGAGATGAAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGCGACAAGAAGCAGGTGCACGCCCTGTTCTACAAGCTGGACGTGGTGCCCATCGACGACAACAACTCCAACACC
TCCTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGTCCCAAGGTGACCTTCGAGCCCATCCCCATCCACTACTGCGCCC
CGCCGGCTTCGCCATCCTGAAGTGCAAGGACAAGAAGTTCAACGGCACCGGCTCCTGCCGGGACGGAGAGATCATCACAACACCGGCCCCGG
AAGATCATCATCGTGCAGCTGAACGAGTCCGTGACCATCAACTGCACCCGCCCCAACAACAACACCCGCAAGAGCATCCGCATCGGCCCCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCCGGGCGGCGACACCCTGAACGCCACTCCTTC
TGGCCAAGAAGCTGGGCGAGTTCTTCTACTGCAACACCTCCCGCCTGTTCAACTCCACCTGGAACAACACCAAGTGGAACTCCACCGGCAAGATCAC
CCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGGCGTGGGCAACAACTCCCAACAACACCCGCAAGAGCATCGAGGGCCTGATCAAGTGCT
CCTCCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACAACATCTCCCGGGCGGCCGAGTGGTGGAAGATCGAGCGCGGCGACATCGCGC
GACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTCCTGGGCGTGGCCCCTACCCGGGCCCGCCGCAGGTGGTGGA
GCGCGAGAAGCGCGCGCAGTGGGCCCATCGTGTCCGGCGCTCCGCCATCGTGCTGCGCGCCATCTGCGGCGTGCTGATCTGCCGCCATGGGCCGCCTGA
CCGGTGGCCCAGCGCCAGCTGCTGTCCGGCATCGTGCGGCAGCTGCGCGCCGCCAGCGCACCTGCTGGGCGTCTGCTC
ACCGTGTGGGGCATCAAGCAGCTGCACGCCCGGGTGCTGGCCGTGGAACGCTACCTGAAGGACCAGCAGCTGCTGGGCATCTGGGGCTGCTC
CGGCAAGCACATCTGCACCACCGCCGTGCCCTGGAACTCCTCCTGGAGCAACAAGTCCCTGGACGAGATCTGGAGGAAGAACGAGCAGGAGCTG
AGTGGGAGCGCGAGATCGACAACTACACCAACACCTGATCTACAGCCTGATCGAGGAGAGCAGCAAGAGGAAGCAGGAGCAGCTG
CTGGAGCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGG
CCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCGTGGTGAACCGCGTGCGCCAGGGCTACAGCCCGTGCGCGAGCAGCTACCACCGCGCCC
CCGCCCCCCCCGCGCGCCCCGAGGGGCATCGAGGAGGAGGGCGGCGAGCAGGGCCGCGACCGGTCCATCCGCCTGGTGAACGGCTTC
TCCGCCCCCTGATCTGGGACGACCTGCGCAGCCTGTGCCTGTTCTCCTACCACCGCCTGCGCGACCTGATCCTGATCGTGGCCCGCATCGTGGA
GCTGCTGGGCCGCCGCGGCTGGGAGGCCCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGAGCCAGGAGCTGAAGAACTCCGCCATCTCCC
TGTTCGACACCATCGCCATCGCCGTGGCGCGCGGCACCGACCGCGTGATCGAGGTGCTGCAGCGCGCCTGCCGCGCCATCCTGCACATCCCC
ACCCGCATCCGCCAGGGCCTGGAGCGCGCCCTGCTGTAA

Fig. 49A

2003 CON_F1 Env

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MRVRGMQRNWQHLGKWGLLFLGILIICNAAENLWVTVYYGVPVWKEATTLFCASDAKSYEKEVHNVWATHACVPTDPNPQEVVLENVTENF
DMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCTDVNATNNDTNDNKTGAIQNCSFNMTTEVRDKKLKVHALFYKLDIVPISNNNSK
YRLINCNTSTITQACPKVSWDPIPIHYCAPAGYAILKCNDKRFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEDIIIRSQNISDNAK
TIIVHLNESVQINCTRPNNNTRKSIHLGPGQAFYATGEIIGDIRKAHCNISGTQWNKTLEQVKAKLKSHFPNKTIKFNSSSGGDLEITMHSF
NCRGEFFYCNTSGLFNDTGSNGTITLPCRIKQIVNMWQEVGRAMYAAPIAGNITCNSNITGLLLTRDGGQNNTETFRPGGGNMKDNWRSELY
KYKVVEIEPLGVAPTKAKRQVVKRERRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNLLRAIEAQQHLLQLTVWGIKQL
QARVLAVERYLKDQQLLGWGCSGKLICTTNVPWNSSWSNKSQDEIWNNMTWMEWEKEISNYSNIIYRLIEESQNQQEKNEQELLALDKWAS
LWNWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRKGYSPLSLQTLIPSPREPDRPEGIEEGGGEQGKDRSVRLVNGFLALVWDDL
RNLCLFSYRHLRDFLLIAARIVDRGLRRGWEALKYLGNLTQYWSQELKNSAISLLNTTAIVVAEGTDRVIEALQRAGRAVLNIPRRIRQGLE
RALL$
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Fig. 50A

2003 CON_F2 Env

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MRVREMQRNWQHLGKWGLLFLGILIICNAADNLWVTVYYGVPVWKEATTLFCASDAKAYEREVHNVWATYACVPTDPSPQELVLGNVTENF
NMWKNNMVDQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDVNVTINTTNVTLGEIKNCSFNITTEIKDKKKEYALFYRLDVVPINNSIVYR
LISCNTSTVTQACPKVSFEPIPIHYCAPAGFAILKCNDKKFNGTGLCRNVSTVQCTHGIRPVVSTQLLLNGSLAEEDIIIRSENISDNTKTI
IVQFNRSVEINCTRPNNNTRKSIRIGPGRAFYATGDIIGDIRKAYCNINRTLWNETLKKVAEEFKNHFNITVTENPSSGGDLEITTHSENCR
GEFFYCNTSDLFNNTEVNNTKTITLPCRIRQFVNMWQRVGRAMYAPPIAGQIQCNSNITGLLLTRDGGKNGSETLRPGGGDMRDNWRSELYK
YKVVKIEPLGVAPTKAKRQVVQREKRAVGIGAVLLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLKAIEAQQHLLQLTVWGIKQLQ
ARILAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSQDEIWDNMTWMQWEKEISNYTDTIYRLIEDAQNQQEKNEQDLLALDKWDNL
WSWFTITNWLWYIKIFIMIVGGLIGLRIVFAVLSVVNRVRQGYSPLSLQTLIPNPRGPERPGGIEEGGEQDRDRSIRLVSGFLALAWDDLR
SLCLFSYRHLRDFLLIAARTVDMGLKRGWEALKYLWNLPQYWGQELKNSAISLLDTTAIAVAEGTDRIIEVLQRAGRAVLHIPRRIRQGFER
ALL$
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Fig. 49B

2003 CON_F1 Env.seq.opt

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ATGCGCGGTGCGCGGCATGCAGCGGCAACTGGCAGCACCTGGGCAGGTGGGCGCCTGCTGCTGTTCCTGGCATCCTGATCATCTGCAACGCCGCCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCCAAGTCCTACGAGA
AGGAGGTGCACAACGTGTGGGCCACCACGCCCTGCGCTGCCTGGCCTGGCTGTGCTGGAGAACGTGACCGAGAACTTC
GACATGTGGAAGAACAACATGGTGGAGCAGATGCACACCGACATCATCTCCGTGGGAGACCAGTCCTGAAGCTGACCCC
CCTGTGCGTGACCCTGACCCTGAACTGCACCGACGTGAACGCCCTGTTCTACAAGGTGCACGCCCTGCCCATCTCCAACAACAACTCCTTCA
ACATGACCACCGAGGTGCGCGACAAGAAGCTGAAGGTGCACCCAGGCCTGCCCATCCCCATCCATCCACTACTGCGCCCCCGC
TACCGCCTGATCAACTGCAACACCTCCAACATCCCCAGGTGTCCTGCAAGAACGTGTCCTGCAAGAACGTGTCCACCGGCATCA
CGGCTACGCCATCTGAAGTGCAACGACAAGAGCGCTTCAACGGCTCCCTGCGGCCGGAGGAGCATCAATCTCCGACAACGCCAAG
AGCCCGTGGTGTCCACCCAGCTGCTGCTGAATCGCCTGGCAGATCAACGGCTCCGTGCAGATCAACACCGCCCAACAACACCTCCGGCAC
ACCATCATCGTGCACCTGAACGAGTCCGTGCAGATCAATCGGCGACATCCGGCGACATCCGCAACATCTCCGGCGACCTGGAGATCAAGATCACCTGGAGCAGG
GGCCTTCTACGCCCACCGGCGAGATCATCGGCGACATCCTCCCCAACAAGACCATCAAGTTCAACTCCTCCCGCGGCGACCTGGAGATCACCGACTCCTTC
TGAAGGCCAAGTGAAGTCCCACTTCCCCAACAAGACCATCAAGTTCAACTCCTCCGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACGAGATCACCCCTGCCCATCAA
GCAGATCGTGAACATGTGGCAGGAGGTGGGCGCCCCATGTACGCCGCGCCAACATCACCGGCC
TGCTGCTGACCCGCGACGGCGGCCAGAACAACCACCGAGGACCTTCCGCGCCGCGCAACTGGCGCTCCGAGCTGTAC
AAGTACAAGGTGGTGGAGATCGAGCCCCTGGCCGTGGCGCCGGCGCCAAGGCCAAGAGGCGCCAAGCGCCGTGGGCAT
CGGCGCCGTGTTCCTGGGCTTCCTGGGCGCAGCAGCAGAACAACCTGCTGCGGGCCCATCGAGCCGCCCCAGCTGCTGT
CCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGGGGCCATCAAGCAGCTG
CAGGCCCGGCTGCTGGGCGTGTGGGGCGCTACCTGAAGGACCAGCAGCTGCTGGGCGTGTACCTGAAGGACCAGCTGGGCGTGTGGGGCGTGATCTGCACCACCAA
CGTGCCCTGGAACTCCTCCTGGTCCAACAAGTCCCAGACCCAGATCTGGAACAACCAGGAGAGATCTCCAACT
ACTCCAACATCATCTACCGCCTGATCGAAGACTCCCAACATCTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTCC
CTGTGGAACTGGTTCGACATCTCGAACCGCGTGCGCAAGGGCTACTCCCCGTCCCTGCCCTGGCCTCGGTGAACGGCCTTCCTGGACCGCGACCGCC
CCGAGGGCATCGAGGAGGGCGGAGCAGGGCAAGGAGCAGGCCAGGGCCTTCCTGGTGAACGGCCTTCCTGGACGCGCGGGGGACCTG
CGCAACCTGTGCCTGTTCCTGTTCCCGCGCCGCCACCTGCGCCGACTTCATCCTGATCGCGGCGCCCATCGTGG
GGCCCTGAAGTACCTGGGCAACCTGAGCCTGGTCCCCAGGAGCTGGGTGCGCCATCGTGTT
TGGCCGAGGGCACCCGGTGATCGAGGGCCTGCGGGCGCCCTGCTGCGCCATCGTGGAG
CGCGCCCCTGCTGTAA
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Fig. 50B

2003 CON F2 Env.seq.opt

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ATGGCGCGTGCGCGAGATGCGCAGCAGATGAGCGGCAACTGGCACCTGGGGCAAGTGGGGGCCTGCTGTTCCTGGGCATCCTGATCATCTGCAACGCCGCCGA
CAACCTGTGGGGTGACCGTGACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGC
GCGAGGTGCACAACGTGCACAACATGGTGGCCACCTACGCCTGCGTGCCTGAGCGTGGTGCTGGGCAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAACAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACGTGAACCGCAACACCAACAACAGCAGCAGCATCAACAACAACCTGCTTCTTCAACA
TCACCACCGAGATCAAGAACAAGGACAAGAAGAAGGAGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCAACAACCTGCTCCATCGTGTACCGC
CTGATCTCCTGCAACACCTCCAAGGTGTCCTTCGACCCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCACTACTGCGCCCCCACCGGCATCCGCCCCG
CGCCATCCTGAAGTGCAACGACGAAGAGTTCAACGGCACCGGCCTGTTCAACGGCCTGTGCCTGAGCGTGTCCACCGTGCACCCAGAGAACCATC
TGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGACATCATCCGCTCCGAGAACATCCTCGACAACATCCCGGCCGCCTT
ATCGTGCAGTTCAACCGGCCGACATCATCGGCGACATCGGGAGATCAACCCGCAAGTCCATCCGCATCGGCGCCGCCTT
CTACGCCCACCGGCGACATCATCAACCCTCCTCCGTGACCTGACCTTCAACATCAACAACACCCTGGAGATCAACACCGAGAGAATCACCCACTCCAACTGCCGC
AGGAGTTCAAGAGAACCACTTCAACATCACCGTGACCTTCAACCTCCGAGGTGAACAACACCGAGAGGTGAACAACATCACCCCTGCCCATCCGCCA
GGCGAGTTCTTCTACTGCAACACCTCCGACCTGTTCAACAACACCCGGCCCCCATCGTACGCGCCCCATCGGCCCGCCCCATCGGCGCCATCCGGCCTGC
GTTCGTGACATGTGCAGCGTGGCAGCGGCGGCCAGGTCTACCGCAGTGGTGGTGCCCAGGCCCCCCAGGTCGCAGCTGGGCATCGG
TGCTGAACCCGCGACGGCGGCAAGAACGGCTCCGAGATCGGGGAAGGTGGTGCTGCTGGCGCCGTGCGGCCCCAGCCCTGCGTCCG
TACAAGGTGGTGCTGCTGCTGGCTTCCTGGGGCCGCGGCCGGGCCGCCCAGCGGCCGTGGGGCATCTGTGGGCATCGAGTCCGCAG
CGCCCGTGCCGTGGGCCTTCCTGGGCGCCGGCCGGTCCGCCCTGCAAGGCCATGAAGGCCCTGAAGGCCCTGGGGGCCATGAAGCTGACCCTGCGTCCG
GCATCGTGCAGCAGTCCGTGCCCAACCTGCTCCAACCTGCTGGGGCTACCTGAAGGAGAAGCTGAAGCTGAGCTGCAG
GCCCTGCAGCATCCTGGCCGTGGAGCGCTACCTGAAGGACCTGAGCCTGCGGCCGTGTGGGCATCGATCTGCACCACCAAGGGAGGAGAAGGAGATCTCCAACTACA
GCCCTGGAACTCCTCCGTGTCCAACAAGTCCCAGGACGACGCCCAGAAGCAGGAGAACAAGAGAACGAGAGAACGAGGAGAAGGAGATCTCCAACTACA
CCGACACCACCATCTACCGCTGGCTGTGGTACATCAAGCTGTTCATCATGATCGTGGGCGGCCTGATCGGGGCCCTGGCCGTGTTCGC
TGGTCCTGCTGGTTCACCATCACCAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCCAGGACCTGATCGAGAGGGCCCTGGGGCCGGACCTGCCCCGC
GCGCCATCGAGGAGGGCGGCGAGCAGGACCGGGCCCCCCAGGACACCGACATGGGCCTGAAGCGCGGGCCTGGGGAGGC
TCCCTGTGCCCGTTCTCCTACCGCCAGCTGCTGCCGACTTCATCCTGATCGCGGCCAGGAGCTGAAGAACCTGCTGGGGCCCTGGGGGCGGACCTGCGCG
CCTGAAGTACCTGTGGAACCTGCTGCAGTACTGGGCGCAGGAGCTGAAGAACTCCGCCGTGAGCCTGTGGGACACCACCGCCGTGG
CCGAGGGCACCGACCGCGTGCTCGAGGTGCTGCAGCGGTGCTGCGCCATCCCGCCGCATCCCCCCGGCCAGGGCTTCGAGCGC
GCCCTGCTGTAA
```

Fig. 51A

2003 CON_G Env

MRVKGIQRNWQHLWKWGTLILGLVIICSASNNLWVTVYYGVPVWEDADTTLFCASDAKAYSTERHNVWATHACVPTDPNPQEITLENVTENF
NMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVNVTNNNTNNTKKEIKNCSFNITTEIRDKKKEYALFYRLDVVPINDNGNSS
IYRLINCNVSTIKQACPKVTFDPIPIHYCAPAGFAILKCRDKKFENGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENITDNT
KVIIVQLNETIEINCTRPNNNTRKSIRIGPGQAFYATGDIIGDIRQAHCNVSRTKWNEMLQKVKAQLKKIFNKSITFNSSSGGDLEITTHSF
NCRGEFFYCNTSGLFNNSLLNSTNSTITLPCKIKQIVRMWQRVGQAMYAPPIAGNITCRSNITGLLLTRDGGNNNTETFRPGGGDMRDNWRS
ELYKYKIVKIKPLGVAPTRARRRVVEREKRAVGLGAVLLGFLGAAGSTMGAASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGI
KQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNTSWSNKSYNEIWDNMTWIEWEREISNYTQQIYSLIEESQNQQEKNEQDLLALDK
WASLWNWFDITKWLWYIKIFIMIVGGLIRIVFAVLSIVNRVRQGYSPLSFQTLTHHQREPDRPERIEEGGEQDKDRSIRLVSGFLALAW
DDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGQELKNSAINLLDTIAIAVANWTDRVIEVAQRACRAILN
IPRRIRQGLERALLS

Fig. 52A

2003 CON_H Env

TRVMETQRNYPSLWRWGTLILGMLLICSAAGNLWVTVYYGVPVWKEAKTLFCASDAKAYETEKHNVWATHACVPTDPNPQEMVLENVTENF
NMWENDMVEQMHTDIISLWDQSLKPCVKLTPLCVTLDCSNVNTTNATNSRFNMQEELTNCSFNVTTVIRDKQQKVHALFYRLDVVPIDDNNS
YQYRLINCNTSVITQACPKVSFEPIPIHYCAPAGFAILKCNNKTFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEQVIIRSKNISDN
TKNIIVQLNKPVEITCTRPNNNTRKSIHLGPGQAFYATGDIIGDIRQAHCNISGKKWNKTLHQVTQLGKYFDNRTIIFKPHSGGDMEVTTH
SFNCRGEFFYCNTSGLFNSSWTNSTNDTKNIITLPCRIKQIVNMWQRVGQAMYAPPIKGNITCVSNITGLILTFDEGNNTVTFRPGGGDMRD
NWRSELYKYKVVKIEPLGVAPTEARRRVVEREKRAVGMGAFFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIQAQQHMLQLT
VWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSLDEIWDNMTWMEWDKQINNYTEEIYRLLEVSQTQQEKNEQDLL
ALDKWASLWNWFSITNWLWYIKIFIMIVGGLRIIFAVLSIVNRVRQGYSPLSFQTLIPNPRGPDRPEGIEEGGEQDRDRSVRLVNGFL
PLVWDDLRSLCLFSYRLLRDLLLIVVRTVELLGRRGREALKYLWNLLQYWGQELKNSAINLLNTTAIAVAEGTDRIIEIVQRAWRAILHIPR
RIRQGFERTLLS

Fig. 51B

2003 CON_G Env.seq.opt
ATGGCGGTGAAGGGCATCCAGCGCGCAACTGGCAGCACCTGTGGAAGTGGGGCACCCTGATCCTGCTGGCCTGTGATCATCTGCTCCGCCTCCAA
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGGAGGACGCCGACACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACTCCA
CCGAGCGCCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCACCCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACAACATGGTGGAGCAGATGCACGAGGACATCATCAACAACATGGTGAGCTGACCCGCCTGCCTGTGGGACGAGTCCCTGAAGCCCTGTGACCCC
CCTGTGCCGTGACCCTGAACTGCACCGACGTGAACTGCACCAAGAAGGAGATCAAGAACGATCAAGGAGAACTGCTCCTTCAACA
TCACCACCGAGATCCGCGACAAGAAGCAGAAGGAGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCAACGACGACAACTCCTCC
ATCTACCGCCTGATCAACTGCAACACCTGTCCCGACGTGCCCCAGGCCTGCCCCAAGGTGACCTTCGACCCCATCCCCATCCACTACTGCGCCCC
CGCCGGCTTCGCCATCCTGAAGTGCCGCGACAAGAAGTTCAACGGCACCGGCCCCTGCAAGAACGTGTCCACCGTGCAGTGCACCCACGGCA
TCAAGCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGATCCTCGCCTGGAGCACTGCAGCACCTGGCCGAGA
AAGGTGATCATCGTGCAGCTGAACGAGATCGTGGAGATCAACTGCACCCGCCCCGGCAACAACACCCGCAAGAGCATCCGCATCGGCCCCGG
CCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCTTCCTGAGATCAAGTGGCGACAAGTGGAACGACATCCTGCAGA
AGGTGAAGGCCCAGCTGAAGGAGCACTTCCCTGCAACAACCTCCGGCGGCGACCTGGAGATCACCATGCACTCCTTCAACTGCCCCTG
AACTGCCGCGGCGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACGGCACCTGGGATCGGCAACGGCACCAAGAGCAACAACAACAACACC
CAAGATCAAGCAGATCGTGCGCATGTGGCAGGGCGTGGGCCAGGCCATGTACGCCCCGCCCATCGCCGGCAACATCACCTGCAAGTCCAACATC
TCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACACCAACAGCACCCAGGAGAACGAGACCTTCCGCCCCGGCGGCGGCGACATGCGCGA
GAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCTCTGGGCGTGGCCCCTACCGAGGCCAAGCGCCGCGTGGTGGAGCGCGAGAAGCGCGC
CGTGGGCATCGGCGCCGTGTTCCTGGGCCTTCCTGGGCGCCGCTGGGCGCCTGGAGGGCTCCGGCGGCGACCGTGCAGGTGCGCC
AGCTGCTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAGGCCCAGCAGCACCTGCTGAAGCTGACCGTGTGGGGCATC
AAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGCGCGACCAGCAGCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTG
CACCACCAACGTGCCCTGGAACACCTCCTGGTCCAACAAGAGTCCCTGGACCAAGATCTGGGACAACATGACCTGGATGGAGTGGGAGCGCGAGA
TCTCCAACTACACCCAGAGCATCTACACCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACGAGCAGGACCTGCTGGCCCTGGACAAG
TGGGCCTCCCTGTGGAACTGGTTCGACATCAGCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCG
CATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACAGCCCGCTGTCCTTCCAGACCCTGGTGTCCCCGCCGCCACCAGC
CCGACCGCCCCGACCGCCCGAGCGGCGGCAGGAGGACGGCGGCGAGCAGGACCGCGACCGCTCCATCCGGCTGGTGAGCGGCTTCCTGGCCCTGGC
GACGACGCTGCGCTCCCTGTGTCTGCGCCTGGGCCTGCGGCTGGTGGAGGCGGTGGCCGTGAGCGTGCTGAACGCCACCGCCATCGCCGTGG
CTCCCTGGAAGGGCCTGGCGGCTGGGAGGCGCTGAAGTACTGGTGGAACCTGCTGCAGTACTGGAGCCAGGAGCTGAAGAACTCCGCCA
TCAACCTGCTGGACACCATCGCCGTGGCCGTGGCCGAGGGCACCGACCGCGTGATCGAGGTGCTGCAGCGCGCCTGGCGCGCCATCCTGCACGG
ATCCCCCGCCGCATCCGCCAGGGCCTGGAGCGCGCCCTGCTGTAA

Fig. 52B

2003 CON_H Env.seq.opt

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ACCCGCGTGATGGAGAGACCCAGCGCAACTACCCCTCCCTGTGGGCGCTGGGCCACCCTGATCCTGGGCATGCTGCTGATCTGCTCCGCCGCCGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCAGCGACGCCAAGGCCTACGAGA
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATGGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACGACATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGAGTCTCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCAACGTGAACGCCACCAACGCCACCAACGTGAACGCCACCAACGCCAGGAGGAGCTGACCAACTGCTCCT
TCAACGTGACCACCGTGATCCGCGACAAGAAGCAGAAGGTGCACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCGACGACAACAACTCC
TACCAGTACCGCCTGATCAACTGCAACACCTCCGTGATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGC
CCCCGCCGGCTTCGCCATCCTGAAGTGCAACAACAAGACCTTCAACGGCACCGGCCCCTGCACCAACGTGTCCACCGTGCAGTGCACCCACG
GCATCCCCGGCGTGGTGTCCACCCAGCTGCTGCTGAACGGCAGCCTGGCCGAGGAGGAGGTGGTGATCAGAAGCGAGAAACATCTCCGACAAC
ACCAAGAACATCATCGTGCAGCTGAACAGCCCGTGGAGATCAACTGCACCCGCCCGCAGGCCAAGTCCATCCACCTGGGCCC
CGGCCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACAACCGCACCATCTCCGGCGGCAAGAAGTGGAACAAGACCCCTGC
ACCAGGTGGTGACCCAGGTGGCAAGTACTGGACAAGTGACCTGGCCAACTCCCGGCGGCGACATGGCCGAC
TCCTTCAACTGCCGCGGCGAGTTCTTCTACTGCAACAGCACCCAGCTGTTCAACTCTGTGGCGCTGGGGCCGCGCCGCGCCGCGGTGGAGCG
CATCACCCTGCCCCTGCCGGCCATCAAGCAGATCGTGATCAGACATGTGGACAGGGCCATGCAGAGCAGCCGCCCCCATCAAGGCCAACATCA
CCTGCGTGTCCAACATCACCGGCCTGATCCTGACCCGCGACGGCGCCAACAACGCCAGCACCGTGCCCGCCAGCAACCGTGACCATGCCGCGAC
AACTGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAACCCCTGGGTTCCTGGCTTCCTGCAGCGAGCAGCGTGCCCACCACCCTGGGGAGCG
CGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCATCCTGGGGCCGCGCCAGCGACAGCGTGCAGCACCTGCTGGGCCTGCTCCGG
TGCAGGCCCTGCCAGTCCCGGCATCTGGAGGCGCCCTGGCGGCCACCCGGTTGAGAAGACCCCTGGAGTCCAACAAGTCCCTGGCTGATGGAGT
GTGTGGGGGGCATCAAGCAGCTGCAGGCCCGGCTGGGGGGAGGCCATCAACATGACCTGGGCCGACCTGGACCTGGATGGAGT
CAAGCTGATCTGCACCACCGCCGTGCCCCTGAGGAGGAGATCTACAACCACCACACCTGGATGGAGTGGGGACAAGAGAGAAGAACGAGGCCAGGGACCTGCTG
GGGACAAGCAGATCAACAACTACACCAGCCTGATCTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACGAGCAGGAGCTGCTG
GCCCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCTCCATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGCGCGCCTG
GATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCCCCCTGTCCTTCCAGACCCTGATCCCCA
ACCCCCGCGGCCCCGCCGGAGGCGCCCTGGAGGGCCTGCTGCTGTTCCTGCGCTGGTGGTCGATCCGCCGTGGTGGCGCGCGTCCTGTGGAGCT
CCCCTGGTGGGGACGACCTGGCGCGCCTGCTCCTGTGTGGGGGCCCCTGAGAGTGCGCCCGAGGGCTGGGCCAGAGTACTGTGGGACCCTGGGAGCT
TGAACAACCACCGCCATCCGCGGCCTGGCCGAGGGCCATCGGAGTCTGCGCCAGGGCCATGCCCAGAGCTGCTGGGCCGCGCCCATCCTGCACATCCCCCCGC
CGCATCCCGCCCAGGGGCTTCGAGCGCGCACCCTGCTGTAA
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Fig. 53A

2003 CON_01 AE Env

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MRVKETQMNWPNLWKWGTLILGLVIICSASDNLWVTVYYGVPVWRDADTTLFCASDAKAHETEVHNVWATHACVPTDPNPQEIHLENVTENF
NMWKNNMVEQMQEDVISLWDQSLKPCVKLTPLCVTLNCTNANLTNVNNITNVSNIIGNITNEVRNCSFNMTTELRDKKQKVHALFYKLDIVQ
IEDNNSYRLINCNTSVIKQACPKISFDPIPIHYCTPAGYAILKCNDKNFNGTGPCKNVSSVQCTHGIKPVVSTQLLLNGSLAEEIIIRSEN
LTNNAKTIIVHLNKSVEINCTRPSNNTRTSITIGPGQVFYRTGDIIGDIRKAYCEINGTKWNEVLKQVTEKLKEHFNNKTIIFQPPSGGDLE
ITMHHFNCRGEFFYCNTTKLFNNTCIGNETMEGCNGTIILPCKIKQIINMWQGAGQAMYAPPISGRINCVSNITGILLTRDGGANNTNETFR
PGGGNIKDNWRSELYKYKVVQIEPLGIAPTRAKRRVVEREKRAVGIGAMIFGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEA
QQHLLQLTVWGIKQLQARVLAVERYLKDQKFLGLWGCSGKIICTTAVPWNSTWSNRSFEEIWNNMTWIEWEREISNYTNQIYEILTESQNQQ
DRNEKDLLELDKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQTPTHHQREPDRPERIEEGGGEQGRDRS
VRLVSGFLALAWDDLRSLCLFSYHRLRDFILLIAARTVELLGHSSLKGLRRGWEGLKYLGNLLLYWGQELKISAISLLDATAIAVAGWTDRVI
EVAQGAWRAILHIPRRIRQGLERALL$
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Fig. 54A

2003 CON_02 AG Env

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MRVMGIQKNYPLLWRGMIIFWMIIFMIICNAENLWVTVYYGVPVWRDAETTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEIHLENVTENFN
MWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCSNTTNNNAGEIKNCSFNMTTELRDKKQKVYALFYRLDVVQINKNNSQYR
LINCNTSAITQACPKVSFEPIPIHYCAPAGFAILKCNDKEFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIVIRSENITNNAKTI
IVQLVKPVKINCTRPNNNTRKSVRIGPGQTFYATGDIIGDIRQAHCNVSRTKWNNTLQQVATQLRKYFNKTIIFANPSGGDLEITTHSFNCG
GEFFYCNTSELFNSTWNSTWNNTEKCITLQCRIKQIVNMWQKVGQAMYAPPIQGVIRCESNITGLLLTRDGGNNNSTNETFRPGGGDMRDNW
RSELYKYKVVKIEPLGVAPTRAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLKLTVW
GIKQLQARVLALERYLKDQQLLGIWGCSGKLICTTTVPWNSSWSNKTYNDIWDNMTWLQWDKEISNYTDIIYNLIEESQNQQEKNEQDLLAL
DKWASLWNWFDITNWLWYIKIFIMIVGGLIGLRIVFAVLTIINRVRQGYSPLSFQTLTHHQREPDRPERIEEGGGEQDRDRSVRLVSGFLAL
AWDDLRSLCLFSYHRLRDFVLLIAARTVELLGHSSLKGLRLGWEALKYLGNLLSYWGQELKNSAINLLDTTAIAVANWTDRVIEIGQRAGRAI
LNIPRRIRQGLERALL$
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Fig. 53B

2003 CON_01_AE Env.seq.opt
ATGCGCGGTGAAGGAGGAGACCCAGATGAACTGCCCAACCTGTGGAAGTGGGGCACCCTGGCCTGCTGGTGATCATCTGCTCCGCCTCCGA
CAACCTGTGGGGTGACCGTGACTACGGGCGTGCCCGTGCCGGCCGACACCACCCTGTTCTGCGCCGACCCCGTTCTGGAGAATCCACCTGGAGAACTTC
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCGTGCCCACCGCCGCAGGAGGACGTGATCTCCCGTGGGACCCAGTGATCTCCCCTGTGGGGACC
AACATGTGGAAGAACAACATGGTGGAGCAGCAGATGCACCAACCTGACCAACGTGTCCAACATCGGCAACATCACCAACG
CCTGTGCCGTGACCCTGAACTGCTCCTTCAACATGACCATGAACATGAACGTGGACCTGAAGAAGACCGACGAAGGTGCACGCCTGCCCCGACCAGCATCCCAT
AGGTGCGCAACTGCTCCTTCAACATGACCATGAACATGAACGTGGACCTGAAGAAGACCGACGAAGGTGCACGCCTGCCCCGACCAGCATCCCAT
ATCGAGGACAACAACTCCTACCGCCGGCTACGCCATCGTGAGTGCAACGACAAGAACTTCAACGGCTCCGTGGAGATCAACAACACCCGCCACCTCCAT
CCACTACTGCGCACCCCGCCGGCATCAAGCCCGGTGGTGTCCACCCAGCTGCTGAACGCGGCTCCCTGGCCAGCAGGAGATCATCCGCTCCGAGAAC
AGTGCACCCACGGCATCAAGCCCGGTGGTGTCCACCCAGCTGCTGAACGCGGCTCCCTGGCCAGCAGGAGATCATCCGCTCCGAGAAC
CTGACCAACAACGCCCCGGCCCCAGTGTTCTACCGCACCATCGGCGACATCCGCAAGGCCTACTGCGAGATCAACGGCACCACCAAGTGGA
CACCATCGGCGGCGCCCCCAGTGTTCTACCGCACCATCGGCGACATCCGCAAGGCCTACTGCGAGATCAACGGCACCACCAAGTGGA
ACGAGGTGCTGAAGCAGGTGACCGAGAAGCTGAAGGAGCACTTCAACAACAAGACCATCTTCCAGCCCCCTCCGGCGGCATCGGCAACGAGACCAT
ATCACCATGCACCACTTCAACTGCCGCGGAGTTCTTCTACTGCAACACCACCAAGCTGTTCAACAACAAGTGCAACACACCTGCATCGGCAACGAGACCAT
GGAGGGCTGCAACGGCTGCCCCATCTGCCGTGTCCAACATCATCTGCTGGAGCCGCGGCCATGTGGCACGGCGGCCAACAACAACCAGCGACCTTCGC
CCATCTCCGCCGCCATCATCTGCTGGAGCCGCGGCCATGTGGCACGGCGGCCAACAACAACCAGCGACCTTCGC
CCCGGCGGCGGCCAACATCAAGGACAACTGGCGCTCTGTAGTACAAGGTGGTCAGATCTTCGGCTGCGCCCCCCACCCG
CGCCAAGCGCCGCTCCATCACCCTGGTGGGAGCGCGAGAAGCGCCCGCCAGCTGCTGTCCGGCATCGTGCGCGGCTCCAACCTGCTGCGCGCCATGG
GCGCCCGCGTCCATCACCCTGGTGGGGAGCGCGAGAAGCGCCCGCCAGCTGCTGTCCGGCATCGTGCGCGGCTCCAACCTGCTGCGCGCCATGG
CAGCAGCACCTGCTCAGCTGACCCTGCAGCGGAGCTGGGGCATGAAGCAGCCGCCGTGTGCAGGGCGGCATCAAGCAGCTGGAGGCGCTACCTGAAGGACCAGAAGTT
CCTGGGCCTGCTGGGGCTGCTCCGGCAAGATCATCTGCACCAGCGCCGTGCCCTGGAACTGCACCTGGTCCAACCGGCTCCTTCCAGAACCAGCAG
GGAACAACAACGAGAAGGACCTGCTGGAGCTGGACAAGTGGGCGAGATCTCCAACCACCAGATCTACGAGGTCGACATCACCAACTGGCTGTGGTACATCAAGAT
CTTCATCATGATCGTGGGCGCCCCAGACCCCACCACCAGCGCGGCGGCCATCATCTTCGCCGTGCTGTCCATCGTGAACAACGCGGCGGCGAGCCGCTCC
TGTCCTTCCAGACCCCACCACCAGCGCGGCGGCCATCATCTTCGCCGTGCTGTCCATCGTGAACAACGCGGCGGCGAGCCGCTCC
GTGCCCTGGTGTCCGTGCCCGCCACCGTGCTGGGCCTTCCTGGGCGACGACCTGCCCTGTTCTCCTTACCACCGCCTGAAGTACCTGGCAACCTGC
GATCGCCCGCGCACCGTGGGCGAGCTGCTGGGCCAGGAGCGTGAAGATCTCCGGCCATCTCCCTGCTGGCGGACGGCGTGGGTGATC
TGCTGTACTGGGGCCAGGAGCTGAAGAACTCCGCCATCCCCGCCATCCTGCACATCCCGCGGGCCTGGGCGGCCTGCAGGGCCTGGAGCGCGTGATC
GAGGTGGCCCAGGGCGCCTGGCGCCCATCCCGCCATCCTGCACATCCCGCGGGCCTGGGCGGCCTGCAGGGCCTGGAGCGCGTGATC
GAGGTGGCCCAGGGCGCCCTGGCGCCCATCCCGCCATCCTGCACATCCCGCGGGCCTGGGCGGCCTGCAGGGCCTGGAGCGCGTGATC
GAGGTGGCCCAGGGCCCCAGGGCGCCTGGCGCCCATCCGCCCAGGGCCTGGGCGGCCTGCAGGGCCTGGAGCGCGCGCCCTGCTGTAA

Fig. 54B

2003 CON_02_AG Env.seq.opt

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ATGGCGCGTGATGGGCATCCAGAAGAACTACCCCCTGCTGTGCGCCTGGGGCATGATGATCATCTTCTGATCATGATCATCTGCAACGGCCGAGAA
CCTGTGGGTGACCGTGTACTACGGCGGTGCCCGTGTGGCGGCGAGACGCCACCACCCGTTCTGCGCCTCCGACGCCAAGGCCTACGACACCG
AGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCCACCTGGAGAACGTGACCGAGAACTTCAAC
ATGTGGAAGAACAACATGGTGGACCAGATGCACGAGGACATCATCAGCCTGTGGGACCAGTCCCTGCGTGAAGCCCTGAAGCTGCCCCCT
GTGGTGTGACCCTGGACTGCGCCGACCTGAACAACACTCCAACACAACATCCAACAACGCCGGCGAGATCAAGAACTGCTCCTTCAACATGA
CCACCGAGCTGCGCGACAAGAAGCAGAAGGTGTACGCCCTGTTCTACCGCCTGGGTGCAGATCAACAAGAACAACTCCCAGTACCGC
CTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCACTACTGCGCACCACGCATCAAGCCCGG
CTTTCGCCCTGAAGTGCAACGACAAGAAGTTCAACGGCACGGCTCCCTGGCCGAGGAGGAGCCCCCAACAACATCGTGTCCGCTCCAAGACCACC
TGGTGTCCCAGCTGCTGTGAAGCCCGTGAAGATCAACTGCGACAAACTGCCCGCCACTGCAACACCCGCAACAGTCCGTGCCGCCAGACCTT
ATCTACGTGCAGCTGGTGAAGCCCGTGGAAGTCGGGCGACATCATCGGCGACATCCGGCCACAGTGTCCCGGCGCAACAACCCTGCGCAGCAGGTGGCCA
CTACGCCACCGGCGACATCATCGGCGACATCTTGCCCAAGAACAGACCCATCTTCAACAAGCCCTGCGCGGCGACCTGGAGAATCCACCCACTCCTTCAACTGCGGC
CCCGAGCTGCGCAAGTAGTTCAACAACAGACCCATCTTCGCCAACTCCAGCTGTTCAACTCCAGCTGTTCAACTCCGAGCTGTTCAACTCCTGGAACTGCGAGTG
GGCGAGTTCTTCTACTGCAACACCTCCGAGCTGTTCAACTCCAGCTGTTCAACACTCCGAGAACTGCAACACCGAGAAGTGCATCACCCTGCAGTG
CCGCATCAAGCAGATCGTGAACATGTGGCAGAAGGTGGCAACAACAACAACATCCAGGGCGTGATCCGCGCGCGGCGCGGCCGACAACTGG
TCACCGGCCTGCTGCTGTACGGCGACAGGTGCTGACGGCGGCCGACATCGGCGCGCGGCCAAGGCGCCGCCTCCATCGCCCTGACCGTGCAGG
CGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGGAGATCGAGCGCCGTGCCGCGCGCCAAGGCGCCGCCTCCATCGCCCTGACCGTGTGG
GCGGCCGGTGGGCCTGTTCCTGGGCGTTCCTGGCCGTGCTCCTGGGCGCGTCCATGGGCGCCAGCGCTGCGCGCCAGCCGACCTGGAGCTGCGCAGG
CCCGCGCCAGCTGCTGTGTCCGGCAACGAGCGCCAGCGTGCTGGCCCTGCTACCTGGAGGCCTGCTGTTGGGCCTGCTCTGGGGCTGGACCTGTGTGG
GGCATCAAGCAGCTGCAGGGCCTGGGCCGTGCTGCCCTGCTCCTCCTGGAACTCCTCCTGCTCGCAGTGCCTACCTGGGCTGCTCCGGCAAGCT
GATCTGCACCACCGCGTGCCCCTGGAACTCCTGGTCAACTCATTACACAACCTACCAACATGACCGAGGAGTCCCAGAACCATGACGACACAGCT
AGGAGAGATCCACCAACTCCAACTACAGCGGTGCTGTTCGACATCACCAACCGCGTGGTACATCAAGATCTTCATCATGATCGTGGGCGGCCCTG
GACAAGTGGGCCCTGCCCCTGTTCGCCGTGTTCGACGATCAACTCATCATCAACCGCGTGGCCCTCTCCCCCTGTCCCTTCGCCGTGCCTGATCGG
CCTGCGCATCGTGTTCGCCGTGCTGAGCGTTCCGCCATCAACTGCGCCGTGATCAACCGCGCGTGTCCGTCCTGTTCCTGCGCTTCCTGGCCCTG
GCGAGCCGGACCTGGCGCCGCATGCATGCATCGAGGAGGGCGGCGAGCAGGAGGCCCTGCGCGGCACCGACCTTCGTGCTGCTGATCGGCAGGCTGTGGG
GCCTGGGCGACGACCTGCGCTCCCTGTGCCTGTTCCTGTACTGGGGCCTGGAGCTGAGGTACTGGTGGCTGTCCTACTGGGCGCAGGAGCTGCTGGG
CCACTCCTCCCCTGAAGGGCCTGCGGCCTGCAACACCCATCGCCTGGAAGTAGTCCTGGCCCATCGCCTGCAACCTGACGACTGGCAGCTGCTGGG
CGGCCACAACTGCTGGACACCATCAACCTGTGGTCTGGCCAACTGGCCATCGCCTGACCTGCTGTCCTACTGGGCCAGAGGAGCTGAAGAACT
CTGAACATCCCCCGGCCATCCCGCCCAGGGCCTGGAGCGCGCCTGTAA
```

Fig. 55A

2003 CON_03 AB Env

MRVKEIRKHLWRWGTLFLGMLMICSATENLWVTVYYGVPVWKEATTLFCASDAKAYSKEVHNVWATYACVPTDPSPQEIPLENVTENFNMG
KNNMVEQMHEDIISLWDQSLKPCVKLTPLCVTLNCTDLKKNVTSTNTSSIKMMEMKNCSFNITTDLRDKVKKEYALFYKLDVVQIDNDSYRL
ISCNTSVVTQACPKISFEPIPIHYCAPAGFAILKCNDKKFENGTGPCTNVSTVQCTHGIKPVVSTQLLLNGSLAEEEVVIRSVNFTDNTKTII
VQLKEPVEINCTRPNNNTRKGIHIGPGRAFYATGDIIGDIRQAHCNISITKWNNTLKQIVIKLRKQFGNKTIVFNQSSGGDPEIVMHSFNCG
GEFFYCNTTKLFNSTWNGTEELNNTEGDIVTLPCRIKQIINMWQEVGKAMYAPPIAGQIRCSSNITGLLLTRDGGNQSNVTEIFRPGGGDMR
DNWRSELYKYKVVKIEPLGVAPTKAKRRVVQREKRAVGIGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNNLLRAIEAQQHLLQL
TVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTAVPWNTSWSNKSLDEIWNNMTWMEWEREINNYTGLIYNLIEESQNQQEKNEQEI
LALDKWASLWNWFDISKWLWYIKIFIMIVGGLVGLRIIFAVLSIVNRVRQGYSPLSFQTRLPTQRGPDRPEGIEEEGGERDRTSIRLVNGF
LALIWDDLRSLCLFIYHHLRDLLLIAARIVELLGRRGWEALKYWWNLLQYWIQELKSSAINLIDTIAIAVAGWTDRVIEIGQRFCRAIRNIP
RRIRQGAEKALQS

Fig. 56A

2003 CON_04 CPX Env

MRVMGIQRNYPHLWEWGTLILGLVIICSASKNLWVTVYYGVPVWRDAETTPFCASDAKAYDKEVHNIWATHACVPTDPNPQEIALKNVTENF
NMWKNNMVEQMHEDIISLWDEGLKPCVKLTPLCVALNCSNATINNSTKTNSTEEIKNCSFNITEIRDKKKEYALFYRLDIVPINDSANNN
SINSEYMLINCNASTIKQACPKVTFEPIPIHYCAPAGFAILKCNDKNFTGLGPCTNVSSVQCTHGIKPVVSTQLLLNGSLATEGVVIRSKNF
TDNTKNIIVQLAKAVKINCTRPNNNTRKSVHIGPGQTWYATGEIIGDIRQAHCNISGNDWNETLQKIVEELRKHFPNKTIIFAPSAGGDLEI
TTHSFNCGGEFFYCNTSELFNSTYMNSTNSTTINKTITLPCRIKQIVSMWQEVGQAMYAPPIAGSINCSSDITGIILTRDGGNNTNNETFR
PGGGDMRDNWRSELYKYKVVKIEPVGVAPTRARRRVVQREKRAVGIGAVFLGELGAAGSTMGAASITLTVQARQLLSGIVQQSNLLRAIEA
QQHLLRLTVWGIKQLQARVLALESYLKDQQLLGIWGCSGKLICTTNVPWNSSWSNKSYNDIWDNMTWLQWDKEINNYTQIIYELLEESQNQQ
EKNEQDLLALDKWANLWNWFNISNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSLQTLIPTTQRGPDRPEGTEEEGEQDRSR
SIRLVNGFLPLIWDDLRNLCLFSYRHLRNLLLIVARTVELLGRGWEALKYLWNLLLYWGQELRNSAINLLDTTAIAVAEGTDRIIEAVQRA
CRAIRNIPRRIRQGLERALLS

Fig. 55B

2003 CON 03 AB Env.seq.opt

Fig. 56B

2003 CON 04 CPX Env.seq.opt
ATGCGCGTGATGGGCATCCAGCGCAACTACCCCCACCTGTGGGGAGTGGGGCACCCTGGCCCTGATCCTGGGCCTGGTGATCATCGCTGCTCCGCCTCCAA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGCGCGAGACCACCACCACCCTTCTGCGCGCCCCCGAGGAGATCGCCCTGAAGAACGTGACCGAGAACTTC
AGGAGGTGCACAACATCTGGGCCACCACGCCTGCGTGCCCCTGGCCCACCCCGAGATCGCCCTGTGGGACGGGCCTGAAGAGCCCTGAGGAGATCAAGAACTGCTCCTTCAACA
AACATGTGGAAGAACAACATGGTGGAGCAGAGATGCACGAGAACATCAACAACTCCACCAGAGACCAACTCCACCGAGGAGATCAAGAACGACTCCGCCAACAACAAC
CCTGTGCGCTGCCCTGAACTGCTCAACGCCGACAAGAAGGAGTACGCCCTTCCACCATCAAGCAGGCCCTGCCCCAAGTGCACTTCGACCTTCGAGCCCATCCCCATCCA
TCACCACCGAGATCCGCGACAAGAAGAAGGAGAGTCGATCAAGCTGCCATCCGAGTACATGCTGAACGACTCCGACCTGCCCCAAGTGACCTTCGACCAACGTCCCATCCCC
CTACTGCGCCCCCGGCTTCGCCACCCTGGTGTGCAAACGACAAGAAGAACTTCACCGGCCTTCACCCACCCGGCCGTGGTGATCCGCTCCAAGAACTTC
GCACCCACGGCCATCAAGCCCGTGGTGTCCAGCTGCTGTGCCAAGGCCGTGAAGATCAACGACAACAAACATCTCCGCGGCGGCGACCTGGAACG
ACCGACAACAACCAGAACACCAGAAACAATCGTGCGCGAGATCAAGGCGCGAGATCATCTTCCGCCCCCTACACACCGGCAAGTCCGTGCA
CATCGGCCCCGGCCCAGACCTGGTACGCCACCGGTGCGCAAGCTGGCCACCATCAACCCGCGAGATCAAGCACTTCCCCAACAAGACCATCTTCGCCCCGGCGGCGGACCTGGAGATC
AGACCCTGCAGAAGATCGTGCAGAGGAGCTGGGCGGCGGCAGTTCTTCTACTGCAACACACCTCCGAGCTGTGTTCAACTGCTGTCCACCAACTCCAC
CACCACCGCCACTCCTTCAACTGCGGCGGCGAGTTCTTCTACTGCGCCCCCCTGCTCCAACATGAACTCCAACTCCAC
TCGCCGCCGCTCCATCACCCTGCTCCTCCCCGACACTGGGCCCAACTGGCCAACCAGAGCCCATGTGGGCCGTGCGCGCCCCCC
CCCGGCGGCGGCGGACATGGCCCCGTGGGTGCAGCTGGCCCTGACCGTGTACAAGGTGGTCAACGTGGTGGTCGAGCCCGGCAACAACAACGAGACCTTCCGC
CGCCCGGCCCGGGGCTCCATCAACTGCCTCCTCCGACAACTGGCGCTCCGAGCTGTACAAGTACAAGGTGGTGTTCCTGGCCGTGTCTGGGCCGTGCGGC
GCGCCGCCTCCATCAACCCTGCTGCTCCGACCGTGGGCGAGAGCGCGCCCCCAGCTGCGTGTCCGGCATCCTGCGCGCGCCCATCATCGAGGCC
CAGCAGCACCTGCATCTGGGCGGCCGTGGTGGGCCAAGCTGATCTGCACCACCACCGTGCCCTGGAACTCCTCTGTCCACCAAGTCCTACAACGACATCT
GCTGGGCATCTGGGGCTGCTCCGGCGAAGCTGGGGCACAACAACAAGGAGATCAACAAGCTGTGCACCACCGTGCCCTGGAACTCCTCTGTGAGTCCCAGAACCAGCAGCTG
GGGCACAACAACGAGCAGGAGCAGGACCTGGCCGTGCAGTGGGGACAAGAGGAGATCAACAACTACACCAGCGTGATCAAGCTGCTGGAGGAGTCCCAGAACCAGCAG
GAGAAGAACGAGCAGGAGCTGCTGGCGCTGGACAAGTGGGCCTCCCTGTGGAACTGGTTCAACATCTCCAACTGGCTGTGGTACATCAAGAT
CTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTCTTCGCCGTGCTCAGCATCTTCGCCGTGCTGCGCCCCGAGGGCACCGGCCTACCGCGC
TGTCCCTGCCCTGGTGAACCCTGCGCTTCTGCCGGCCTTCCTGGGCGGCCTGTGGCCTCTGGCCCTGGGCGAGGGCGGGCGCGAGGCAGAGGACCGGCGTCCCGC
TCCATCCGCCCTGATCCTGCCCACCACCGCGGCCCAGCGCGGCCTGGAACGGCCTTCCTGGAGGAGGAAGTACCGTGAAGTACCTGTCGGAAGCTGCT
GCTGATCGTGGCCCGCATCGTCGAGCTGCTGGGGCCGCAGCCACCGCTGCTGGACACCGTGGCGAGGGCCTGAAGTACCTGTCTGCTGCGCCAACCTGCT
AGCTGCGCAACTCCGCGCAACTGCTCTGCTGGACACCGTGGCGAGGGCCATCATCGAGGCGCGCGCCACCGCCAGGGCCCTGCTACTGGGGCGCAGG
TGCCGCGCAACATCCGCCAACATCCCCGCGCCAGGCCCATCGTCGGAGCGCGCGCCCTGCTGTAA

Fig. 57A

2003 CON_06_CPX Env

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MRVKGIQKNWQHLWKWGTLILGLVIICSASNMMWTVYYGVPAWEDADTILFCASDAKAYSAEKHNVWATHACVPTDPNPQEIALENVTENF
NMWKNHMVEQMHEDIISLMDESLKPCVKLTPLCVTLNCTNVTKNNNTKIMGREEIKNCSFNVTEIRDKKKKEYALFYRLDVVPIDDNNNSY
RLINCNASTIKQACPKVSFEPIPIHYCAPAGFAILKCRDKNFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIKSENLTDNTKT
IIVQLNKSVEIRCTRPNNNTRKSISFGPGQAFYATGDIIGDIRQAHCNVSRTDWNNMLQNVTAKLKELFNKNITFNSSAGGDLEITTHSFNC
GGEFFYCNTSQLFNSTRPNETNTITLPCKIKQIVRMWQRVGQAMYAPPIAGNITCTSNITGLLLTRDGNNNDSETFRPGGGDMRDNWRSELY
KYKVVKIKPLGIAPTRARRRVVGREKRAVGLGAVFLGFLGTAGSTMGAASITLTVQVRQLLSGIVQQQSNLLRAIEAQQHLLQLTVWGIKQL
QARVLAVERYLKDQQLLGIWGCSGKLICPTNVPWNASWSNKTYNEIWDNMTWIEWDREINNYTQQIYSLIEESQNQQEKNEQDLLALDKWAS
LWSWFDISNWLWYIKIFIMIVGGLIGLRIVFAVLSIVNRVRQGYSPLSLQTLIPNPTGADRPGEIEEGGGEQGRTRSIRLVNGFLALAWDDL
RSLCLFSYHRLRDFVLIAARTVETLGHRGWEILKYLGNLVCYWGQELKNSAISLLDTTAIAVANWTDRVIEVVQRVFRAFLNIPRRIRQGFE
RALL$
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Fig. 58A

2003 CON_08_BC Env

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MRVRGTRRNYQQWWIWGVLGFWMLMICNVEGNLWVTVYYGVPVWKEAKTTLFCASDAKAYETEVHNVWATHACVPTDPNPQEIVMENVTENF
NMWNNDMVNQMHEDVISLWDQSLKPCVKLTPLCVTLECTNVSSNGNGTYNETYNESVKEIKNCSFNATTLLRDRKKTVYALFYRLDIVPLND
ENSGKNSSEYYRLINCNTSAITQACPKVTFDPIPIHYCTPAGYAILKCNDKKFNGTGQCHNVSTVQCTHGIKPVVSTQLLLNGSLAEREIII
RSENLTNNVKTIIVHLNQSVEIVCTRPNNNTRKSIRIGPGQTFYATGDIIGDIRQAHCNISKDKWYETLQRVSKKLAEHFPNKTIKFASSSG
GDLEITTHSFNCRGEFFYCNTSGLFNGTYMNGTNNSSSIITIPCRIKQIINMWQEVGRAMYAPPIEGNITCKSNITGLLLVRDGGRTESNNT
EIFRPGGGDMRNNWRNELYKYKVVEIKPLGVAPTAAKRRVVEREKRAVGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLR
AIEAQQHMLQLTVWGIKQLQQTRVLAIERYLKDQQLLGIWGCSGKLICTTAVPWNSSWSNKSQQEIWDNMTWMQWDKEISNYTNTIYRLLEDS
QNQQERNEKDLLALDSWKNLWSWFDITNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRVRQGYSPLSFQILTPNPGGPGRLGRIEEEGGEQD
KTRSIRLVNGFLALAWDDLRNLCLFSYHRLRDFILLTARGVELLGRNSLRGLQRGWEALKYLGSLVQYWGLELKKSTISLVDTIAIAVAEGT
DRIINIVQGICRAIHNIPRRIRQGFEAALQ$
```

Fig. 57B

2003_CON_06_CPX Env.seq.opt

ATGCGCGTGAAGGGCATCCAGAAGAACTGGCAGCACCTGTGGAAGTGGGGCACCCTGATCCTGGCCTGGTGATCATCTGCTCCGCCTCCAA
CAACATGTGGGTGACCGTGTACTACGGCGTGCCGGAGGACGCCGACACCATCCTGTTCTGCGCCTCCAAGGCCTACTCCG
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCAGGAGATCGCCCTGGAGAACTTC
AACATGTGGAAGAACCACACATGGTGGAGCAGATGCACGAGGACATCATCTCCCTGTGGGACGAGTCCGAGGCCGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCCGCGACCAAGAACAACAACCACCAAGATCATGGGCGAGATCAAGAACTGCTCCTTCAACG
TGACCACCGAGATCCGCGACAAGAAGAAGAAGTACGCCCTGTTCTACCGCCTGGACGTGGTGCCCATCGACGACCAACAACTCCTAC
CGCCTGATCAACTGCAACGCCCTCCACCATGCCGCGACAAGCAGGCCTGCCCCAAGGTGTCCTTCGAGCCCATCCCCATCCGCTGGCGCAGC
CTTCGGCCATCCTGAAGTGCCGGACAAGAACTTCAACGGCTCCTGGCCGCGAGGAGGAGATCAGCCCCAACAACACCTGTGCAGTCCCGGCCAGGC
CCGTGGTGTCCAGCTGCTGCTGACGGGCTGCTGCTGGGAGATCCGTGGAGATCCGGGAGAGCCAAGTCCATCTTCGGCCACCGACTGCTGGAACAACATGCTGCAGAACGTGA
CTTCTACGCCACCGGCGACATCATCGGCGACATCTCCGGGCCCAGCGCCAACTTCAACTCACCTTCAACACCCACTCCTTCAACTGC
CCGGCCAGCTGGAAGGAGCTGTTCAACAAGAACATCACCTTCCGCGCGACCTGGAGATCAACACCATCACCCTGCCCTGCCAAGATCAA
GGCGGGCGAGTTCTTCTACTGCAACACCTCCCCAGCTGTTCAACTGCCGTGGGGCCATGTACGCCCCCATCGCCGCGGCAACGAGATCGGCC
GCAGATCGTGCGCAACCTGCCATGTGGCGCAGGCCGTGGGCCAACAACGACTTCCGCGCACCCCGCCCCCGCGCCGCCGAGCTCCGAGCTGTAC
TGCTGCTGACCCGCGGACGGCAACAACGAGCCCCTGGGCATCGCCGGGCTCCAACTGCTGCTCCATCGAGGGCGCCCAGCTGCTGT
AAGTACAAGGTGGTGAAGATCAAGCCCCTGGGCCTTCCTGGGCGTTCCTGCAGCAGCAGTCCAACCGCGTCCAACCTTCCATCGAGGCCCCAGCTGCAAGCAGCTG
GGGGCGCCGTGTTCCTGCAGCAGTCCAACCGGCCAGCTCCAACCTGCCCATCGAGGGCGCGCTGCTGGGGCATCGAGCGTGTGGGCATCAAGCAGCTG
CAGGCCCCCGCTGCTGGCCGTGCGCGCTACCTGGAGCGCCGCTACCTGAAGGACCAGCAGCTGCTCTCCGGACGTGATCTGCCCCACCAA
CGTGCCCTGGAACGCCCTCCTGGTCAACAAGACCTACAACAGAGATCTGGGACAACATGACCTGGATGGACCGCGAGATCAACAACT
ACACCCGACCAGAGATCTACTACTCCCTGATCGAGGAGTCCCAGAACCAGCAGGAGAAGAACGAGAGCTGCTGGGCGGCCTGTATCGGCCTGGCCTCC
CTGTGGTTCCTGGTTCGACATCTCCAACTGCCTGTGTGTACCGTGCGCCGCCAGGGCGCCCAGCGCGAGCCCCTGATCGGCCTGATCGGCCATCGTGTT
CGCGGCGAGATCGAGGAGGGCGGCGGCGAGCAGGGGCGCGAGCGCTTCCTGGCCCTGCTGGCCCTGGGGACGACCTG
CCCGGGCGAGATCGAGGAGGGCGGCGGCGAGCAGGGGCGCGAGCGCTTCCTGGCCCTGCTGGCCCTGGGGACGACCTG
CGCTCCCCTGCCCGTGTTCTTCTGCCCGCGGACTTCGTGCTGATCGCCCGCGACGCTGGAGAAGAACTCCCTGCTGGGACACCACCGGCCG
GATCCTGAAGTACCTGGGCAACCTGTCGTGCTACTGGGGCGAGCTGGGGCAAGCAGCGGCCTGGGCGCCCGCGCCCATGCGCCG
TGGCCAACTGGACCGCGTGTTCCGCGCCGTTGCTGAGGTGGTGCAACCGCGTGATCGAGGTGGTGCAGGGCGCGTGCTGGGA
CGCGCCCTGCTGTAA

Fig. 58B

2003 CON_08_BC Env seq.opt

ATGCGCGTGCGCGGCACCCGCCGCAACTACCAGCAGTGGTGGATCTGGGGCGTGCTGGGCTTCTGGATGCTGCTGATGATCTGCAACGTGCTGGAGG
CAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCAAGACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGAGA
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGATGGAGAACGTGACCGAGAACTTC
AACATGTGGAACAACGACATGGTGAACCAGATGCACGAGGACGTGATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCC
CCTGTGCGTGACCCTGAACTGCACCGACCTGAGAAACGTGTCCACCAACGGCACCTACAACGAGACCGTGAAGGAGATCAAGA
ACTGCTCCTTCAACGCCACCACCTGCTGCGCGACCGCAAGAAGACCGGTGTACGCCCTGTTCTACCGCCTGGACATCGTGCCCCTGAACGAC
GAGAACTCCGGCAAGAACTCCGGAGTACTACCGCCTGATCAACTGCAACACCTCCGCCATCACCCAGGCCTGCCCCAAGGTGACCTTCGA
CCCCATCCCCATCCACTACTGCGCCCCGGCTACGCCCCGGCCATCGTGAAGCGCTCCCTGAAGTGCAACGACAAGAAGTTCAACGGCCAGTGCCACAACG
TGTCCACCGTGCAGTGCACCCACCGGCATCAAGCCCGTGGTGTCCACCCAGCTGCTCCTGAACGGCTCCCTGGCCGAGGAGATCGTGA
CGCTCCGAGAACTTCACCGACAACGTGACCACCATCATCGTGCACCTGAACGAGTCCGTGGAGATCGTGTGCACCCGCCCAACAACAC
CCGCAAGTCCATCCGCATCGGCCCCGGCCAGGCCTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCAGGCCTGCAACATCTCCA
AGGACAAGTGGTACGAGACCCTGCAGCGCGTGTCCAAGAAGCTGGCCGAGCACTTCCCCAACAAGACCATCAAGTTCGCCTCCTCCGGC
GGCGACCTGGAGATCACCACCACCACTCCTTCAACTGCCGCGGAGTTCTTCTACTGCAACACCTCCGGCCTGTTCAACGGCACCTACATGAA
CGGCACCAACAACTCCTCCTCCATCATCAACGTGAAGCAGCATCATCAACATGTGGCAGGAGGTGGCCGCGCCATGTACG
CCCCCCCATCCATCGAGGGCAACATCACCTGCAAGTCCAACATCACCGGCCTGCTGGTGGTGCGCGACGGCGGCGAGTCCAACAACACC
GAGATCTTCCGCCCCCACCGGCGCCAAGCGCCGCGTGGTGGAGCGCGAGAAGCGCGCCGTGGGCATCGGCCTTCCTGGGCGCCGCCG
GGCCCCCACCGGCCAAGCGCCGCCCTCCATCACCGACCTGACCTGCAGCTGACCTGGGGCTGCTCTGGGCCGGGCCATCAAGCAGTCCC
GCCATCGAGGGCACCCAGCAGCACCATGCTGGGCGCCCGCTGGTGTGGGCAAGCTGGACAGAGGAGATCTGCAGGCGCGCTACCTGAA
GGACCAGCAGCTGCTGGGCATCTGGGGCGTGCTGCTCCGGGCTGGCCGGATCGTGCAGAGGGACAAGCTGACCGTGTGGGGCATCAAGCAGTCCC
AGCAGGAGATCTGGACAACAATGACCTGGATGCAGTGGCGACAAGGAGATCTCCAACTACACCGCCTGCTGGACAGTCCC
CAGAACCAGCAGGAGAAGAACGACCTGGCCTGCGGCCCTGATCGGCGCCGCCTGTCCGTGTCCGTGCTGCTGCTGACTGGCGTGTG
GTACATCAAGATCTTCATCATGATCGTGGGCGGCCTGACCGCCTGGCATCATCTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCAGG
GCTACTCCCCCGTCCTTCCAGATCCTGACCCGCCTGGTCGAACGGCTTCCTGGCCCTGGCGCGCCTCCCTGGGCCTGCTGGGCACTGCTGGGCTACCACCGCCTGCGG
AAGACCCGCTCCATCCGCCTGGTGAACGGCTTCCTGGCCCTGGCCTGGGACGACCTGCGCAGCCTGTGCCTGTTCTCCTACCACCGCCTGCGCG
CGACTTCATCCTGCTGACCGCCGTGACTGGCGCCTGGGCCTGGGGGCCTGGAGCTGAAGAACTCCGCCATCAACCTGCTGGACAGCCTGAAGTACC
TGGGCCTGCCCTGGTGCAGTGCTACTGGAACATCGTGCAGGGCATGGGGCTTCGCCGCCATCCGCCAGGGCTTCGAGGGCGCCCTGAAGGGCACC
GACCGCGCATCATCAACACATCGTGCCGCCGCCATCCAACAACATCCCCGCCGCCATCCGCCAGGGCTTCGAGGGCGCCCCTGCAGTA
A

Fig. 59A

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2003 CON_10_CD Env
MRVMGIQRNCQQWWIWGILGFWMLMICNATGNLWVTVYYGVPVWKETTTLFCASDAKAYKAEAHNIWATHACVPTDPNPQEIVLENVTENF
NMWKNGMVDQMHEDIISLWDQGLKPCVKLTPLCVTLNCSDVNATNSATNTVVAGMKNCSFNITTEIRDKKKQEYALFYKLDVVQIDGSNTSY
RLINCNTSAITQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEEIIIRSENLTDNAKT
IIVQLNESVTINCTRPNNNTRKSIRIGPGQTFYATGDIIGNIRQAYCNISGTEWNKTLQQVAKKLGDLLNKTTIIFKPSSGGDPEITTHTFN
CGGEFFYCNTSKLFNSSWTSNNTGNTSTITLPCRIKQIINMWQGVKAIYAPPIAGLINCSSNITGLLLTRDGGANNSETFRPGGGDMRDNW
RSELYKYKVKIEPLGLAPTKAKRRVVEREKRAIGLGAVFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQNLLRAIEAQQHLLQLTVW
GIKQLQARVLAVESYLKDQQLLGIWGCSGKHICTTNVPWNSSWSNKSLEEIWDNMTWMEWEREIDNYTGLIYSLIEESQNQQEKNEQELLQL
DKWASLWNWESITNWLWYIKIFIMIVGGLIGLRIVFAVLSLVNRVRQGYSPLSFQTLLPAPRGPDRPEGIEEGGEQGRGRSIRLVNGFSAL
IWDDLRNLCLFSYHRLRDLILIATRIVELLGRRGWEAIKYLMNLLQYWIQELKNSAISLLDTTAIAVAEGTDRAIEIVQRAVRAVLNIPTRI
RQGLERALLS
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Fig. 60A

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2003 CON_11_CPX Env
MRVKETQRNWHNLWRWGLMIFGMLMICNATENLWVTVYYGVPVWKDADTTLFCASDAKAYSTEKHNVWATHACVPTDPNPQEIPLENVTENF
NMWKNNMVEQMHEDIISLWDESLKPCVKLTPLCVTLNCTDVKNATNTTVEAAEIKNCSFNITTEIKDKKKEYALFYKLDVVPINDNNNSIY
RLINCNVSTVKQACPKVTFEPIPIHYCAPAGFAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEGEVRIRSENFTNNAKT
IIVQLNSSVRINCTRPNNNTRKSIHIGPGQAFYATGDIIGDIRQAHCNISRAEWNNTLQQVAKQLRENFNKTIIFNNPSGGDLEITTHSFNC
GGEFFYCNTSRLFNSTWNNDTRNDTKQMHITLPCRIKQIVNMWQRVGQAMYAPPIQGKIRCNSNITGLLLTRDGGNNTNETFRPTGGDMRD
NWRSELYKYKVVEIKPLGVAPTRAKRRVVEREKRAVGIGAVLLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLKAIEAQQHLLKLT
VWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTNVPWNFSWSNKSYDEIWDNMTWIEWEREINNYTQTIYTLLEESQNQQEKNEQDLL
ALDKWASLWNWFDISNWLWYIKIFIMIVGGLIGLRIIFAVLSIVNRCRQGYSPLSFQTLTPNHKEADRPGGIEEGGGEQDRTRSIRLVSGFL
ALAWDDLRNLCLFSYHRLRDFLIAARIVETLGRRGWEILKYLGNLAQYWGQELKNSAISLLNATAIAVAEGTDRIIEVVHRVLRAILHIPR
RIRQGFERALLS
```

Fig. 59B

2003 CON 10 CD Env.seq.opt
ATGCGCGGTGATGGGCATCCAGCAGCAGTGGTGGATCTGGGGCATCCTGGGCTTCTGGATGATCTGCAACGCCACCGG
CAACCTGTGGGTGACCGTGCTGTACGGCGTGCCCGTGTGGAAGGAGACCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACAAGG
CCGAGGCCCCACAACATCTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGATCGTGCTGGAGAACGTGACCGAGAACTTC
AACATGTGGAAGAACGGCATGGTGGACCAGATGCACGAGGACATCATCTCCCTGTGGGACCAGGCCCTGGCCGGCCATGAAGAACTGCTCCTTCAACA
CCTGTGCCGTGACCCTGAACTGCTCCGACGTGGACAACCTCCGGCCACCAACGTGGCCCTGTTCTACAAGCTGGACGTGGTGCCAATCCCCAGTGCTCCTAC
TCACCACCGAGATCCGCGACAAGGAAGCAGGAGTACGGCCCTGCCCCAAGGCCTGCCCGACGTGGTGCAGATCGAGCATGGGCCCATCAAGC
CTTCGCCACCATCTGAAGTGCAACGACACAAGAAGTTCAACGGCACCTGCTCCACCATCACCAACTGCTACTGCGCCACCGATCAAGCC
CCGTGGTGTCCACCCAGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGATCATCATCCGCAACAACAACCACCCGGAGAACTGTCCGAGAGACC
ATCATCGTGCAGCTGAACGAGTCCGTGACCATCAACTGCACCCGCCCGAATCATCGGCCAGCTGCAACATCTCCGGCACCGAGTGGAACAAGACCTGCAGCAGGTGG
CTTCTACGCCACCGGCGACATCATCGGCGACATTCTTCAAGCCCTCCTCCGGCGGCACCCGAGATCAACACACCCCATCACCACCTTCAAC
CAAGAAGCTGGGCGACCTGCTGAACAAGACCATCATCTTCAAGCAGTCCTCCGGTGGTTCTTCTACTGCAACACCACCTGTCCGAAGTCTGTTCAACTCTCCTCCAACTCTCCACCATCACCCT
GCGCCTGCCGCGATCAAGCAGATCATCAACATGTGGCAGGGGTGGGCAAGGCCATCACGCGCGGCGCCAACAACTGCCTGATCAACTGCTCCT
CCAACATCACCGGCCTGCTGCTGACCCGCGACGGCGGCAACAACATCTCCGAGACCTTCCGCCCTGGCGGCGCCAAGGCCAAGCGCGGCGTGGTGCAGCGCGGAGAA
CGCTCCGAGCTGTACAAGTACAAGGTGGTGAAGATCGAGCCCCTTCCTGGGCGTTCCTGGGCTTCCTGGGCTTCCTGGGGCGCATCGTGCTGCAGCCTTGCGCCGTGTGGG
GCGCCCAGCATCTTCCTGGGCGCCTGTTCCTGGGCTTCCTGGGCTTCCTGGCCAGCAGCAACCTGCTGCGCGCCCTGCTGCGCGCCTGCTGGGGCGTGGTGTGGAA
CCGCGGGCTGCGTGCTGCAGCCCGCGGCCAGCCCGCCGAGTGTCAACAAGTCCCTGGAGGAGATCCCTGGTCCAACAAGTCCCTGGTCCAACAAGC
GGCCATCGAGGTGCTGCAGCGGGCCGCCCGCGCCATCCTGCATCTGCCCCGCCGCCTGGGGCGGGCGACAACGTGACCGGCCTGCTGGGGAGC
GCGAGGATCGACGAACTACACCACCGGGCCTGGTTCTCCATCACCAACTGGCTGTGGTACATCAAGATCTTCATCATGATCGTGGGGCGGCTGATCGG
CCTGCGCATCGTGTTCGCCGTGCTGTCCGGTGGTGGTGAACCGCGTGCGCCAGGGGCGGCGAGCAGGCCCGCGGCTTCTCGCGCCCTG
GCGGCCCGCCGGACGGCGGCGAGGGCATGCACCCGTGGGCCAGCAGCAGCCTGATCGGCCTGGGGCGCCATCGTGGAGCGTGGGGG
ATCTGGGACGACCTGCGCAACCTGTGCCTGTTCTCCTACCACCGCCTGCGCGACTGGCACCGCCGCCTGCTGGGGAACCTGTGGGGGGTTGGGGAC
CCGGCCCGCCGGCCGCGTGGGGCGGGCCGTGCCGCGCACGGCGCCGAGGCACCGGGGGGGGGGCTTGCTGCTGGACA
CCACCGCCATCGCCGTGGCGAGGGCACCGACCGGGTGCTGGGGGAGCTGGGGAACATCCCCACCGCATC
CGCCAGGGGCCTGGAGCGCGGGCGCCCTGCTGTAA

Fig. 60B

2003 CON 11_CPX Env.seq.opt

```
ATGGCGCGTGAAGGAGGACCCAGCGCCAACTGGCACAACCTGTGGCGCTGGGGCCTGATGATCTTCGGCATGCTGATGATCTGCAACGCCACCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCGTGTGGAAGGACGCCGACACCACCCTGTTCTGCGCCTGGGAGAACGTGACCGAGAACTTC
CCGAGAAGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACATCATCTCCCTGTGGGACGAGTCCTGCCGAGTCCTGAAGCCCTGACCCCC
AACATGTGGAGAACAACATGGTGGAGCAGATGCACGAGGACACGCCACCAACACCGTGGAGGCCGCCGAGATCAAGAACTGCTCCTTCAACATCA
CCTGTGCTGACCCTGAACTGCACCGACGTGAAGAACGCCAACCACCGTGGTGCCCGAGATCAAGAACGACAACAACTCCATCTAC
CACCGAGATCAACTGCAAGCGTGTCCACCGTGGAAGCAGGCCCTGTTCTACAAGCTGGTGCCCATCAACGACAACTCCATCTAC
CGCCTGATCAACTCCTGACAGTGCAACGACAAGAAGTTCAACGGCCTCCCTGCCGGAGGTGCGCAGTGCCCACGGCATCAAGC
CCGTGGTGTCCCACCCAGCTGCTGCTGCTCCCGTGCGCATCAACGGCGCATCATGGCCGCCCACAACAAACGCCCGGCCAGGC
ATCATCGTACGCCACCGCGACATCATCGGCGACATCCGCCCAGGCCAACTGCAACACCCTGCAGCAGGTGG
CTTCTACGCCACCGGCGACATCATCGGCGACATCCGCCCAGGCCAACTGCAACACCCTGCAGCAGGTGG
CCAAGCAGCTGCGCGAGAACTTCAACAAGAACACCTCCGGCCGCCTGGAGATCACCACCGCCACCTTCAACTGC
GGCGGCGAGTTCTTCTACTGCAACACACCTCCCGCCGCATCAACGACAACGACAACCCGCCATGGGCCAGC
CTGCCCCTGCCGCATCAAGCAGCAGATCGTGAACATGTGGCAGCGCGTGGGCAACAACACCAACACCAGACCCCC
ACTCCAACATCACCGGCCTGCTGCTGACCCGCGACATCCGCCCACCGGCGGCGCCCGCCATGCGCGAC
AACTGGCGCTCCGAGCTGTACAAGGTGGTGGAGATCAAGCCCGGCTTCCTGGGCGCTCCGTGCGTGGGAGCG
CGAGAAGCGCCGCCCGCCAGCTGCTGTCCGGCATCGGCCCGGCATCGTGCGCCGTGCGTCCTCCATCACCCTGACCG
TGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCGCCGTGCCCTGCTGAAGGCCATCGAGGCCCAGCTGACC
GTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGAAGGACCTGGATCGAGT
CAAGCTGATCTGCACCACCAACGTGCCCTGGAACGACATCTCCAACAGCGTGGTACAACATGACCTGGGCGGCCT
GGGAGCGCGAGATCAACAACTACACACCCTGTGGAACTGGTTCGACATCTCCAAGCGCTGCGTGTCCTCCGGGATCGAGT
GCCCTGGACAAGTGGGCCCCTGCGCATCATCTTCGCCGTGCTGTCCATCGTGAACCTGCTGGGCGCCCT
GATCGGCCTGCGCATCATCTTCGCCGTGCTGTCCATCGTGAACCTGCTGGGCGCCCT
ACCACAAGGAGGCCCGCCCCGCCATCAACGGCCATCTGGGGCCTGAGGGCCAGGAGACTCCTGC
GCCCTGGCCGCGCGGGACCTGCCAACCTGTGCCTGTTCTCCTACCACGCCGACTTCATCGTGTCCCGCATCGTGGAGAC
CCTGGCCGCCGCGGGACCTGCCAACCTGTGGGAAGTACCTGGCCAACCTGGGCAAGTACCTGGGGCCACCGCGATCATCGAGTGTGCGCGCGCCCACCGCGCCATCCTGCCACATCCCCCGC
TGAACGCCACCACCGCGAGGGCACCGACCATCATCGAGTGTGGTGCGCGCGCCACCGCGCCATCCTGCCACATCCCCCGC
CGCATCCGCGCCTTCGAGCGCGCGCGCCCTGCTGTAA
```

Fig. 61A

2003 CON 12 BF Env
MRVRGMQRNWQHLGKWGLLFLGLILIICNATENLWVTVYYGVPVWKEATTLFCASDAKSYEREVHNVWATHACVPTDPNPQEVDLENVTENF
DMWKNNMVEQMHTDIISLWDQSLKPCVKLTPLCVTLNCTDANATANATKEHPEGRAGAIQNCSFNMTTEVRDKQMKVQALFYRLDIVPISDN
NSNEYRLINCNTSTITQACPKVSWDPIPIHYCAPAGYAILKCNDKKFNGTGPCKNVSTVQCTHGIKPVVSTQLLLNGSLAEEIIIRSQNIS
DNAKTIIVHLNESVQINCTRPNNNTRKSIHIGPGRAFYATGDIIGDIRKAHCNVSGTQWNKTLEQVKKKLRSYFNTTIKENSSSGGDPEITM
HSFNCRGEFFYCNTSKLFNDTVSNDTIILPCRIKQIVNMWQEVGRAMYAAPIAGNITCTSNITGLLLTRDGGHNETNKTETFRPGGGNMKDN
WRSELYKYKVVEIEPLGVAPTRAKRQVVKREKRAVGIGALFLGFLGAAGSTMGAASITLTVQARQLLSGIVQQQSNLLRAIEAQQHLLQLTV
WGIKQLQARVLAVERYLKDQQLLGLWGCSGKLICTTNVPWNSSWSNKSQEEIWENMTWMEWEKEINNYSNEIYRLIEESQNQQEKNEQELLA
LDKWASLWNWFDISNWLWYIRIFIMIVGGLIGLRIVFAVLSIVNRVRKGYSPLSLQTHIPSPREPDRPEGIEEGGGEQGKDRSVRLVNGFLA
LIWDDLRSLCLFSYHRLRDLLLIVTRIVELLGRRGWEVLKYWWNLLQYWSQELKNSAISLLNTTAIVVAEGTDRVIEALQRVGRAILNIPRR
IRQGLERALL$

Fig. 62A

2003 CON 14 BG Env
MKAKGTQRNWQSLWKWGTLILGLVIICSASNDLWVTVYYGVPVWKEATTLFCASDAKAYDAEVHNVWATHACVPTDPNPQEVALENVTENF
NMWENNMVDQMQEDIISLWDQSLKPCVELTPLCVTLNCTDFNNTNTTNTRNDGEGEIKNCSFNITTSLRDKIKKEYALFYNLDVVQMDND
NSSYRLTSCNTSIITQACPKVSFTPIPIHYCAPAGFVILKCNNKTFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAEEIVIRSKNFTD
NAKTIIVQLKDPIEINCTRPNNNTRKRITMGPGRVLYTTGQIIGDIRKAHCNISKTKWNNTLGQIVKKLREQFMNKTIVFQRSSGGDPEIVM
HSFNCGGEFFYCNTTQLFNSTWRSNSTWNDTTETNNTDLITLPCRIKQIVNMWQKVGKAMYAPPISGQIRCSSNITGLLLIRDGGSNNTETF
RPGGGNMKDNWRSELYKYKVVKIEPLGVAPTRAKRRVQREKRAVGIGALLFGFLGAAGSTMGAASMTLTVQARQLLSGIVQQQNNLLRAIE
AQQHMLQLTVWGIKQLQARVLAVERYLKDQQLLGIWGCSGKLICTTTVPWNASWSNKSLDDIWNNMTWMEWEREIDNYTGLIYTLIEQSONQ
QERNEQELLELDKWASLWNWFNITNWLWYIKIFIMIIGGLIGLRIVFAVLSIINRVRKGYSPLSFQTLTHHQREPDRPGRIEEEGEQDKDR
SIRLVSGFLALAWDDLRSLCLFSYHRLRDFILIAARTVELLGRSSLKGLRLGWEGLKYLWNLLLYWGRELKNSAINLLDTVAIAVANWTDRA
IEVVQRVGRAVLNIPVRIRQGLERALLS

Fig. 61B

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2003 CON_12_BF Env.seq.opt
ATGCGCGTGCGCGGCATGCAGCGCAACTGGCAGCACCTGGGCAAGTGGGGCCTGCTGTTCCTGGCATCCTGATCATCTGCAACGCCACCGA
GAACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGTCCTACGAGC
GCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACATGCAGAACGCCACCAACCCCCAGGAGGTGACCCTGAAGCTGACCCC
GACATGTGGAAGAACAACATGGTGGAGCAGATGCACAAGGACATCATCTCCCTGTGGGACCAGAGCACCCGCCGCCATCCAGAACT
CCTGTGCCGTGACCCTGACCCCCCTGTGCGTGACCCTGACTGCGGCCCGGAGGGCGCCCTGAAGCCCTGACCCGCCATCCAGACCCT
GCTCCTTCAACATGACCAACATGACCAACGAGGTGCGCAACGACGGAGTCGAGATGAAGGTGCAGGCCCTGTTCTACGCCATCTCCGACAAC
AACTCCAACGAGTACCGCCTGATCAACTGCAACACCTCCACCATCACCCAGGCCTGCCCCAAGGTGTCCTTCGAAGAAGTTCAACGGCACCGGAG
CTGCGCCCCCGCCATCAAGCGCCTACGCCGTGGTGTCCACCCCGTGGTGCTGAACGGCTCCCCTGGCCGCACCCCCGCCCTGGCCGCAGATCAAC
CCCACGCGCATCAAGCGCCCTGTGGTGTGCACCCCGTGGTGCTGAACGGCTCCGTGCAGATCAACCGCGAGATCTCCTTCGAGAGAAGTTCAACGGCACCGGAG
GACAACGCCAAGAACGATCATCGTGCACCTGAAGCCCTGACCATGGGCGACATCATCGGCGCCTCCTACTTCAACACCACCAAGTCAAGCTGGTGCAGTGGAGAAGGAGGAGAC
CGGCCCCGAGCTGAAGAGAAGCTGCGCTCCTTCAACATGACCAAGAGCTGCGCTCCTTCAACGTGTGTTCAACGCCGCCATCAGCTGCACCTCCAACA
CACTCCGGCCATCAAGGCCGGCCCATCAGAAGCTGCGCGAGTTCTTCTACTGCAACACCTCCAAGCTGTTCAACGACACCATCACCTGCCCCTG
CCGCATCATCAAGCAGATCGTGACGATCGTGCTGAACATGTGGCAGGAGGTGGGCGCCACAACGAGACCGGCCACCATCACCTGCCCCTG
TCACCGGCCTGCTGCCGAGCTGAACAAGTGGTGGTGAACAAGACCGAGACCTTCCGCCCCACCCGGCGCCGCCCAGGTGGTGAAGCGGCGA
GAAGCGCCCGCCGCCAGCTGCTGGGCATCGCTGTCGCCGGGCATCGTCGCCGGCCCTGGGGCCGCGCCAGCAGCACCTGCTGCAGCGTGGGGCTGCGTG
AGGCCCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGGGCATCGTCGCCGGCCCTGGGGCCGCGCCAGCAGCACCAAGAGGAGATCTGGGGCAA
TGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGGGCATCGTCGCCGGCCCTGGGGCCGCGCCAGCAGCACCAAGAGGAGATCTGGGGCAA
GCTGATCTGCACCACCGCCGTGCCCTGGAACTCCTCCTGGTCCAACGAGATCTACCGCGCCTGATCGAGGAGTCCCAGAGTCCCAGGAGCTGCTGGCC
AGAAGGAGAGATCAACAACTACTACCAGCATCTGGTTCGAACATGGTTCGAACATCTCCAACTGGCTGTGTGTACATCTTCATCATGATCGTGGGCGGCCTGAT
CTGGACAAGTGGCCTCCCTGTGAACTGGGCCGCCGTGTTCGCTGCGTGTTCCTGACCATCGTGTGTGGTACATCTCCAACTGGCTGTGTGTACATCTTCATCATGATCGTGGGCGGCCTGAT
CGGCCTGCGCATCGTGTTCGCCGTGGGGCCCGAGGGGCATCGGGCATCCCCGGCCTTCCTGGCCCTGTGTGTGTGTGTGTGTGTGGGCATCCCCGGCCTTCCTGGCC
CCCGCGAGCCCGACCCCGAGGGGCATGCATCCCCGTGCTCCTACCACCGGCCTGCGCATCGTGTTCGCCGTGGGGCCCGAGGGGCATCCCCGGCCTTCCTGGCC
CTGATCTGGGACGACCTGCGCTCCCTGTGTCTGCGGGGCTCCTGGCGCATCCCGGCCTTCCTGGCCCTGTGTGTGTGTGTGTGTGGGCATCCCCGGCCTTCCTGGCCTGCT
GGGCCGCCGCGGCTGGGAGGCTGTTGCTGAACTCGGTGCTGACGGCGCTGGGCGGCACCGACGCCCTGGGCGCATCCTGATCCTGGAGGCTGCT
ACACCACCGGCCATCCTGGGCATCCTGGAGGGCGCCGAGGGCACCGACGCCCTGGGCGCATCCTGATCCTGAACATCCCCGGCGC
ATCCGGCCAGGGCCTGGAGCGCGACCGCCTGCTGTAA
```

Fig. 62B

2003 CON_14_BG Env.seq.opt

ATGAAGGCCAAGGGCACCCAGCGCAACTGGCAGTCCCTGTGGAAGTGGGGCACCCTGATCCTGGGCCTGGTGATCATCTGCTCCGCCTCCAA
CGACCTGTGGGTGACCGTGTACTACGGCGTGCCCGTGTGGAAGGAGGCCACCACCACCCTGTTCTGCGCCTCCGACGCCAAGGCCTACGACG
CCGAGGTGCACAACGTGTGGGCCACCCACGCCTGCGTGCCCACCGACCCCAACCCCCAGGAGGTGGTGCTGGGCAACGTGACCGAGAACTTC
AACATGTGGGAGAACAACATGGTGGACCAGATGCAGGAGGACATCATCTCCCTGTGGGACCAGTCCCTGAAGCCCTGCGTGAAGCTGACCCCC
CTGTGTGTGACCCTGAACTGCACCGACCTGCGCAACGACACCAACACCACCAACAACAGCTCCGAGGGCATGAAGAACTGCTCCTTCAACATCACC
ACCTCCATCCGCGACAAGATCCAGAAGGAGTACGCCCTGTTCTACAAGCTGGACATCGTGCCCATCGACAACAACAGC
AACTCCTCCTACCGCCTGATCAGCTGCAACACCTCCATCATCACCCAGGCCTGCCCCAAGGTGTCCTTCACCCCCATCCCCATCCACTACTGC
GCCCCCGCCGGCTTCGTGATCCTGAAGTGCAACAACAAGACCTTCAACGGCACCGGCCCCTGCACCAACGTGTCCACCGTGCAGTGCACCCAC
ACGGCATCCGCCCCGTGGTGTCCACCCAGCTGCTGCTGAACGGCTCCCTGGCCGAGGAGGAGGTGGTGATCCGCTCCGCCAACGTGACCGACAAC
AACGCCAAGACCATCATCGTGCAGCTGAACGAGTCCGTGGAGATCAACTGCACCCGCCCCAACAACAACACCCGCAAGTCCATCCGCATCGGC
CCCGGCCGCGCTGCTGTACACCACCGGCGACATCATCGGCGACATCCGCCAGGCCCACTGCAACATCTCCAGAGCCAAGTGGAACACCACCCTG
TGGGCCCAGATCGTGAAGGAGCTGCGCGGCGAGTTCTTCTACTGCAACACCAGCTGTCTGTTCAACAGAACCACCAGCCTGTTCAACGGCACCTGGATCGTGATG
CACTCCTTCAACTGCGGCGGCGAGTTCTTCTACTGCAACACCACCAGCTGTCTGTTCAACGCCTGCCCCAGGGCCTGGCCTTCAACGCCAGGCCCATGTACG
CACCGAGACCAACACCGACCTGGGGCCCATCTCCGGCGGCGGCGACATCATCACCCTGCCCTGCCGCATCAAGCAGATCATCAACATGTGGCAGAAGGTGGGCAAGGCCATGTACG
CCCCCCCCATCTCCGGCCAGATCAAGCTGCGCTCCCTCCAACATCACCGGGCTGCTGCTCCGAGCTGTACAAGTACAAGGTGGTCGTGCTGCCCCGGCCGTGGCCCCCCAC
CGCGCGCAAGGCCGTGGGCCGCGCGAGAGCGCGAGAAGCGCGCCGTGGGCATCGGCGCCGTGTTCCTGGGCTTCCTGGGCGCCGCCGGCTCCACCA
TGGGCGCCGCCTCCATGACCCTGACCGTGCAGGCCCGCCAGCTGCTGTCCGGCATCGTGCAGCAGCAGAACAACCTGCTGCGCGCCATCGAG
GCCCAGCAGCACATGCTGCAGCTGACCGTGTGGGGCATCAAGCAGCTGCAGGCCCGCGTGCTGGCCGTGGAGCGCTACCTGAAGGACCAGCA
GCTGCTGGGCATCTGGGGCTGCTCCGGCAAGCTGATCTGCACCACCACCGTGCCCTGGAACAGCTCCTGGTCCAACAAGTCCCTGGACGACA
TCTGGAACAACATGACCTGGATGGAGTGGGACCGCGAGATCGACAACTACACCGGCCTGATCTACGACCTGCTGGAGAAGTCCCAGAACCAG
CAGGAGCGCAACGAGAAGGACCTGCTGGCCCTGGACAAGTGGGCCAGCCTGTGGAACTGGTTCAACATCACCAACTGGCTGTGGTACATCAA
GATCTTCATCATGATCGTGGGCGGCCTGATCGGCCTGCGCATCGTGTTCGCCGTGCTGTCCATCGTGAACCGCGTGCGCCAGGGCTACTCCC
CCCTGTCCTTCCAGACCCTGCTGCCCACCCCGCGTGTTCCCCGCCCTGGACCGCCTCGGGGAGGGCACCGAGGAGGGCGGCGAGCGCGACCGCGAGGGACAAGGACCGC
CCTGATCGTGGGCTTCCTGGCCCTGGCCGAGCGGCTGATCCGCTGCTCCTTCTCCTACCGCCTGCGCGACCTGCTGCTGATCGTGGGCCGCG
TGCTGCTGCTGCTACTGGGGCAAGAACTCCGCCATCAACTGCCTGTGCTGGGCCGGCCTGGGCCATCCCCGTGGGCCATCTCGGCTGCTGGCCGGC
ATCGAGGTGGTCAGCGCCGTGGGGCGGCGCGCCGTGCTGAACATCCCCGTGCTGAACATCCCCCGCCGGCTGGAGCGCGCCGGACCGCGCC
CCAGGGCCTGGAGCGCGGCCTGCTGTAA

Centralized HIV-1 gag/nef/pol Protein and the Codon-optimized Gene Sequences

Fig. 63A

1. 2003_CON_S gag.PEP

MGARASVLSGGKLDAWEKIRLRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCQQIIEQLQPALQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSKQKTQQAAADTGNSSKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMS
QVTNTTIMMQRGNFKGQKRIIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAE
SFGFGEEITPSPKQEPKDKELYPLASLKSLFGNDPLSQ$

Fig. 63B

2003_CON_S gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGGCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCAGCAGATCATCG
AGCAGCTGCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACACCACCATCATGATGCAGCGCGGCAACTTCAAGGGCCAGAAGCGCATCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCAGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCGGCCGAG
TCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCCCAAGGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTCCCTGTT
CGGCAACGACCCGCTGTCCCAGTAA

Fig. 64A

2. 2003 M.GROUP.anc gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMGQLQPALQTGTEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSQQKTQQAAADKGDSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNANIMMQRGNFKGPRRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAE
SFGFGEEITPSPKQEPKDKELYPLASLKSLFGSDPLSQ$

Fig. 64B

2003 M.GROUP.anc gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGCCGACAAGGG
CGACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCACCCTGAACCG
CCTGGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCAGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCATCCCCCGGCCCAGATGCGCGAGCCCCGTGGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCGATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCATCGTGGCCAAGGGCCATCGTGGCCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCGCCCGAG
TCCTTCGGCTTCGGCGAGGAGATCACCCCGTCCCCCAAGCAGGAGCCCAAGGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTCCCTGTT
CGGCTCCGACCCCCTGTCCCAGTAA

Fig. 65A

3. 2003 CON A1 gag.PEP

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MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETTEGCQQIMEQLQPALKTGTEELRSLYNTVATLYCVHQRI
DVKDTKEALDKIEEIQNKSKQKTQQAAADTGNSSKVSQNYPIVQNAQGQMVHQSLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTPQEQIGWMTGNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMTACQGVGGPGHKARVLAEAMS
QVQHTNIMMQRGNFRGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEI
FGMGEEITSPPKQEQKDREQDPPLVSLKSLFGNDPLSQS
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Fig. 65B

3. 2003 CON A1 gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCACCGAGGGCTGCCAGCAGATCATGG
AGCAGCTGCAGCCCGCCCTGAAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGTCCCTGTCCCCGAGGGCCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGAGCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCATCCCGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCAGGCACGACCTCCACCCCCCAGGAGC
AGATCGGCTGGATGACCGGCAACCCCCCGATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGACCGCGTGCCAGGGCGTGGGCGGCCCAGGGCCACAAGGCGCGGTGCTGGCGAGCCATGTCC
CAGGTGCAGCACACCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCAGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGATC
TTCGGCATGGGCGAGGAGATCACCTCCCCCCCCAAGCAGGAGCAGAAGGACCGCGAGCAGGACCCCCCCCTGGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA
```

Fig. 65C

4. 2003_A1.anc gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMGQLQPALKTGTEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEIQNKSKQKTQQAAADTGNSSKVSQNYPIVQNAQGQMVHQSLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTGNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVQNTDIMMQRGNFRGPKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAEN
FGMGEEMISSPKQEQKDREQYPPLVSLKSLFGNDPLSQ$

Fig. 65D

2003_A1.anc gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGGCAAGCTGGACGCGCCTGGGAGAAGATCCGCCTGCGCCTGAAGCACCTGGTGTGGGC
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCACCGGCACCGGCACCCTGAAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTG
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCAAGGGCCAGATGGTGCACCAGTCCCTGTCCCCCGCACC
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGTCCCTGTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
AGATCGGCTGGATGACCGGCAACCCCCCCATCCCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACGCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGAACACCGACATCATGATGCAGCGCGGCAACTTCCGCGGCCCCAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCCCCTGGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

SUBSTITUTE SHEET (RULE 26)

Fig. 66A

5. 2003_CON_A2 gag.PEP

MGARASILSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELEKFSINPSLLETSEGCRQIIRQLQPALQTGTEELKSLYNTVAVLYCVHQRI
DVKDTKEALDKIEEEQNKCKQKTQHAAADTGNSSSSSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMS
QVQNTNIMMQRGNFRGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFPQSRTEPTAPPA
ENLRMGEEITSSLKQELKTREPYNPAISLKSLFGNDPLSQ$

Fig. 66B

2003_CON_A2 gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGAAGTTCTCCATCAACCCCTCCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCATCC
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCGTGCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTGCAAGCAGAAGACCCAGCACGCCGCCGCCGACACCGG
CAACTCCTCCTCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCCATCCCGCCAGGAGGTGGACATCCTGGACAGCGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCAACTTCCGGCGCGGCCAACTTCCGGCGCGGCAAGGAGGGG
CAGGTGCAGAACACCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGG
CCACCTGGCCCGCAACTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCACCGAGCCCACCGCCCCCCCCGCC
GAGAACCTGCGCATGGGCGAGGAGATCACCTCCTCCCTGAAGCAGGAGCTGAAGACCCGCGAGCCCTACAACCCCGCCATCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCCTGTCCCAGTAA

Fig. 67A

6. 2003_CON_B_gag.PEP

MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
YSPTSILDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNSATIMMQRGNFRNQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPE
ESFRFGEETTTPSQKQEPIDKELYPLASS

Fig. 67B

2003_CON_B_gag.OPT

ATGGGCGCCCGCCTCCGTGCTGCTGGGCGGCGAGCTGGACCGCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACAAGCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCCATCCCTGGACATCGCCCCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTAC
TACTCCCCCACCTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACTCCGCCACCATCATGATGCAGCGCGGCAACTTCCGCAACCAGCGCAAGACCGTGAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCAAGAACTGCCGCGCCCCCAGGAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAG
GAGTCCTTCCGCTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGGCCTCCTAA

Fig. 67C

7. 2003_B.anc gag.PEP
MGARASVLSGGKLDKWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPALQTGSEELRSLYNTVATLYCVHQRI
EVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRM
YSPISILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMS
QVTNSTTIMMQRGNFRDQRKIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPE
ESFRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPSSSQ$

Fig. 67D

2003_B.anc gag.OPT
ATGGGCGCCCGCGGCCTCCGTGCTGTCCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACAAGCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCCAGATCCTGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCTCCGAGGAGCTCCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGTGGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCATCTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGCCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGACCAACTCCACCACCATCATGATGCAGCGCGGCAACTTCCGCGACCAGCGCAAGATCGTGAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAG
GAGTCCTTCCGCTTCGGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCTCCTCCCAGTAA

Fig. 68A

8. 2003_CON_C_gag.PEP

MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLYNTVATLYCVHEKI
EVRDTKEALDKIEEEQNKSQQKTQQAKAADGKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTM
LNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSP
VSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQAN
NTNIMMQRSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQNRPEPTAPPAESFR
FEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ$

Fig. 68B

2003_CON_C_gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTCCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGAAGATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCAAGGCCGCCGACGG
CAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACGCCTGGGTGA
AGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATG
CTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGT
GCACGCCGGCCCCATCGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCGCCT
GGATGACCTCCAACCCCCCGATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
GTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGCCAAC
AACACCAACATCATGATGCAGCGCTCCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACCAGATCGC
CCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACT
TCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCGCCCGAGTCCTTCCGC
TTCGAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGAAGTCCCTGTTCGGCTCCGACCCCCTGTC
CCAGTAA

Fig. 68C

9. 2003_C.anc.gag.PEP

MGARASILRGGKLDTWEKIRLRPGGKKHYMIKHLVWASRELERFALNPGLLETSEGCKQIMKQLQPALQTGTEELRSLYNTVATLYCVHERI
EVRDTKEALDKIEEEQNKSQQKTQQAEAADGNGKVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMTACQGVGGPGHKARVLAEAMS
QANNTNIMMQRSNFKGPKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAE
SFREETTPAPKQEPKDREPLTSLKSLFGSDPLSQ$

Fig. 68D

2003_C.anc.gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACACCTGGGAGAAGATCCGCCTGCGCCTGCGCCCGGGCGGCAAGAAGCACTACATGAT
CAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTCCTGGAGACCTCCGAGGGCTGCAAGCAGATCATGA
AGCAGCTGCAGCCCGCACTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGAGGCCGCCGACGG
CGACAACGGCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCGTGGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGCCTGGATGACCTCCAACCCCCCGATCCCTGTCCGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCGAGCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCAACAACACCAACATCATGATGCAGCGCTCCAACTTCAAGGGCCCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCA
CATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGG
CCAACTTCCTGGGCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCGGCCGAG
TCCTTCCGCTTCGAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGAAGTCCCTGTTCGGCTCCGA
CCCCCTGTCCCAGTAA

Fig. 69A

10. 2003_CON_D_gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHIVWASRELERFALNPGLLETSEGCKQIIGQLQPAIQTGSEELRSLYNTVATLYCVHERI
EVKDTKEALEKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPEATLEEMMTACQGVGGPSHKARVLAEAMS
QATNSAAVMMQRGNFKGPRKIIKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPA
ESFGFGEEITPSQKQEQKDKELYPLTSLKSLFGNDPLSQ$

Fig. 69B

2003_CON_D_gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTCCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCG
GCCAGCTGCAGCCCGCCATCCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGATCGAGGAGGAGCAGAACAAGTCCAAGAAGAAGGCCCAGCAGGCCGCCGCCGACACCGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCGTGGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGAGGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCTCCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCACCAACTCCGCCGCCGTGATGATGCAGCGCGGCAACTTCAAGGGCTGCCGCAAGATCATCAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCAAGAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCGTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCC
GAGTCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCAGAAGCAGGAGCAGAAGGACAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCT
GTTCGGCAACGACCCCCTGTCCCAGTAA

Fig. 70A

11. 2003_CON_F gag.PEP

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MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALDPGLLETSEGCQKIIGQLQPSLQTGSEELRSLYNTVAVLYCVHQKV
EVKDTKEALEKLEEEQNKSQKTQQAAADKGVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIQWMTSNPPVPVGDIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQATN
TAIMMQKSNFKGQRRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGF
REEITPSPKQEQKDEGLYPPLASLKSLFGNDP$
```

Fig. 70B

2003_CON_F gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGGACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCAGAAGATCATCG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCGTGCTGTACTGCGTGCACCAGAAGGTG
GAGGTGAAGGACACCAAGGAGGCCCTGGAGAAGCTGGAGGAGGAGCAGAACAAGTCCCAGAAGACCCAGCAGGCCGCCGCCGACAAGGG
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCCACCCTGAACGCCTGGGTGAAGG
TGATCGAGGAGAAGGCCTTCTCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCACCCCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
CGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCCAGTGGA
TGACCTCCAACCCCCCCGTGCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCGCCGCCACCCA
GGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCCGGCGCCA
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGCCACCAAC
ACCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCAAGAA
CTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCTTC
CGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCAGAAGGACGAGGGCCTGTACCCCCCCCTGGCCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA
```

Fig. 71A

12. 2003_CON_G_gag.PEP

```
MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPDLLETAEGCQQIMGQLQPALQTGTEELRSLFNTVATLYCVHQRI
EVKDTKEALEEVEKIQKKSQQKTQQAAMDEGNSSQVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKDTINEEAAEWDRMHPQQAGPIPPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMS
QASGAAAAIMMQKSNFKGPRRTIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPP
AESFGFGEEIAPSPKQEQKEKELYPLASLKSLFGSDP$
```

Fig. 71B

2003_CON_G_gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCGCCTGGGAGGAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGACCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCACTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGGAGGTGGAGAAGATCCAGAAGAAGAGTCAGCAGAAGACCCAGCAGGCCATCTCCCCCGCCGACGAGGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCAT
GCACCCCCAGCAGGCCGGCCCCATCCCCCCAGGCCAGATCCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCCGCTGGATGACCTCCAACCCCCCGATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCATCTCCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCTCCGGCGCCGCCGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCCGCGCCGCACCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCC
GCCGAGTCCTTCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGCAGAAGGAGAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCTCCGACCCCTAA
```

Fig. 72A

13. 2003_CON_H gag.PEP

```
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCLQIIEQLQPAIKTGTEELQSLFNTVAVLYCVHQRI
DVKDTKEALGKIEEIQNKSQQKTQQAAADKEKDNKVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDL
NAMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIAWMTGNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPSHKARVLAEAMS
QVTNANAAIMMQKGNFKGNFKGPRKIVKCFNCGKEGHIARNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSSKGRPGNFLQSRPEPTAPP
AESFGFGEEMTPSPKQELKDKEPPLASLRSLFGNDPLSQS
```

Fig. 72B

2003_CON_H gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCTGCAGATCATCG
AGCAGCTGCAGCCCGCCATCAAGACCGGCACCGAGGAGCTGCAGTCCCTGTTCAACACCGTGGCCGTGCTGTACTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGGCAAGATCGAGGAGATCCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGCCGACAAGGA
GAAGGACAACAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACGCCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGAGAGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGCCTGGATGACCGGCAACCCCCCCATCCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGTGACCAACGCCAACGCCGCCATCATGATGCAGAAGGGCAACTTCAAG
GGCTGCTTCAAGTGCGGCAAGGAGGGCCACATCGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCA
CCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCTGCAGTCCC
GCCCCGAGCCCACCGCCCCCCCCGCCGAGTCCTTCGGCTTCGGCGAGGAGATGACCCCCTCCCCCAAGCAGGAGCTGAAGGACAAGGAGCCC
CCCCTGGCCTCCCTGCGCTCCCTGTTCGGCAACGACCCCCTGTCCCAGTAA
```

Fig. 73A

14. 2003_CON_K gag.PEP

MGARASVLSGGKLDTWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETEGCRQIIRQLQPSLQTGSEELKSLFNTVATLYCVHQRI
EVRDTKEALDKLEEQNKSQQKTQQETADKGVSQNYPIVQNLQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQITWMTSNPPVPVGEIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKTILKALGPGASLEEMMTACQGVGGPGHKARILAEAMSQVTN
TAVMMQRGNFKGQRKIIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPAESFGF
GEEITPSPRQETKDKEQGPPLTSLKSLFGNDPLSQ$

Fig. 73B

2003_CON_K gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACACCTGGGAGAAGATCCGCCTGCGCCCGGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCGCTGCTGGAGACCGAGGGCTGCCGCCAGATCATCC
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGCTGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGAGACCGCCGACAAGGG
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCCTGTCCCCGCAGACCCTGAACGCCTGGGTGAAGG
TGATCGAGGAGAAGGCCTTCTCCCCGGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCGCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
CGCCGGCCCCCATCCCCCCGGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCACCTGGA
TGACCTCCAACCCCCCGGTGCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
TCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCATCCTGCGCGCCGAGCAGGCCACCCA
GGAGGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCCGGCGCCT
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCATCCTGGCCGAGGCCATGTCCCAGGTGACCAAC
ACCGCCGTGATGATGCAGCGCGGCAACTTCAAGGGCCAGCGCAAGATCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCCGCAA
CTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCGCCCGAGTCCTTCGGCTTC
GGCGAGGAGATCACCCCCTCCCCCCGCCAGGAGACCAAGGACAAGGAGCAGGGCCCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCCCTGTCCCAGTAA

Fig. 74A

15. 2003 CON 01 AE gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPGLLETAEGCQQIIEQLQSTLKTGSEELKSLFNTVATLWCVHQRI
EVKDTKEALDKIEEVQNKSQKTQQAAAGTGSSSKVSQNYPIVQNAQGQMVHQPLSPRTLNAWVKVVEEKGFNPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKETINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIGWMTNNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKARVLAEAMS
QAQHANIMMQRGNFKGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFPQSRPEPTAPPAEN
WGMGEEITSLPKQEQKDKEHPPPLVSLKSLFGNDPLSQ$

Fig. 74B

2003 CON 01 AE gag.OPT

ATGGGCGCGCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATCG
AGCAGCTGCAGTCCACCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCGTGGCCACCCTGTGGTGCGTGCACCAGCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGTGCAGAACAAGTCCCAGAAGACCCAGCAGGCCGCCGCCGGCACCGGAACG
CTCCTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCCCTGTCCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGGCTTCAACCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGAGACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCTGGCACTACGGTGACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCAACAACCCCCCGTGGGCCGACATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGAAGGCCCTGG
GCACCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCCAGCACGCCAACATCATGATGCAGCGCGGCAACTTCAAGGGCCAGAAGCGCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGGCCCGAGCCCACCGCCCCCCCCGCCGAGAAC
TGGGGCATGGGCGAGGAGATCACCTCCCTGCCCAAGCAGGAGCAGAAGGACAAGGAGCACCCCCCTGGTGTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 75A

16. 2003_CON_02_AG gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIMEQLQSALRTGSEELKSLYNTVATLWCVHQRI
DIKDTKEALDKIEEVQNKSKQKTQQAAAATGSSSQNYPIVQNAQGQMTHQSMSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDLNMM
LNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIVLGLNKIVRMYSP
VSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTETLLVQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQVQ
QSNIMMQRGNFRGQRTIKCFNCGKEGHLARNCKAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFPQSRPEPTAPPAESFGM
GEEITSSPKQEPRDKGLYPPLTSLKSLFGNDPS

Fig. 75B

2003_CON_02_AG gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
AGCAGCTGCAGTCCGCCCTGCGCACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCCTGTGGTGCGTGCACCAGCGCATC
GACATCAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGTGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGCCACCGG
CTCCTCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGACCCACCAGTCCATGTCCCCGCGCACCCTGAACGCCTGGGTGA
AGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACATGATG
CTGAACATCGTGGGCGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGTGCACCCCGT
GCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCGGCT
GGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCGTGCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
GTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGGGCCCCGGCG
CCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGTGCAG
CAGTCCAACATCATGATGCAGCGCGGCAACTTCCGCGGCCAGCGCACCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCTGGCCCGCAA
CTGCAAGGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCCCCAGTCCCGCCCCGAGCCCACCGCCCCGCCCGCCGAGTCCTTCGGCATG
GGCGAGGAGATCACCTCCTCCCCCAAGCAGGAGCCCCGCGACAAGGGCCTGTACCCCCCGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA

SUBSTITUTE SHEET (RULE 26)

Fig. 76A

17. 2003_CON_03_ABG gag.PEP

MGARASVLSGGKLDAWEKIRLRPGGKKKYRIKHLVWASRELERFALNPSLLETSEGCQQILEQLQPTLKTGSEELKSLYNTVATLYCVHQRI
EIKDTKEALDKIEEIQNKSKQKTQQAATGTGSSSKVSQNYPIVQNAQGQMTHQSMSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRLHPAQAGPFPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTETLLVQNANPDCKTILRALGSGATLEEMMTACQGVGGPGHKARVLAEAMS
QVQNANIMMQKSNFRGPKRIKCFNCGKDGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGRIWPSSKGRPGNFPQSRPEPSAPPAEN
FGMGEEITPSLKQEQKDREQHPPSISLKSLFGNDPLSQ$

Fig. 76B

2003_CON_03_ABG gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCAT
CAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCTCCGAGGGCTGCCAGCAGATCCTGG
AGCAGCTGCAGCCCACCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACAGTCGCTACGCTGTACTGCGTGCACCAGCGCATC
GAGATCAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCACCGGCACCGG
CTCCTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGACCCACCAGTCCATGTCCCCGCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCT
GCACCCCGCCCAGGCCGGCCCCTTCCCCCCAGGCCAGATGCGCGAGCCTCGCGGCTCCGACATCGCCGGCACTACGTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCT
TCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGG
GCTCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGAACGCCAACATCATGATGCAGAAGTCCAACTTCCGCGGCCCCAAGCGCATCAAGTGCTTCAACTGCGGCAAGGACGGCCACCT
GGCCCGCAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCCGCATCTGGCCCTCCTCCAAGGGCCGCCCGGGCAACTTCCCCCAGTCCCGCCCCGAGCCCTCCGCCCCCCCCGCCGAGAAC
TTCGGCATGGGCGAGGAGATCACCCCCTCCCTGAAGCAGGAGCAGAAGGACCGCGAGCAGCACCCCCCATCTCCCTGAAGTCCCTGTT
CGGCAACGACCCCCTGTCCCAGTAA

Fig. 77A

18. 2003_CON_04_CFX gag.PEP

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MGARASVLSGGKLDAWERIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQLMEQLQSTLKTGSEELKSLFNTIATLWCVHQRI
DVKDTKEALDKVEEMQNKSKQKTQQAAADTGGSSNVSQNYPIVQNAQGQMVHQSISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRAHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKCLRAEQATQEVKNWMTETLLVQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKARVLAEAMS
QASNAAAAIMMQKSNFKGQRRIIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGRMWPSSKGRPGNFLQSRPEPTAPP
AESLEMKEETTSSPKQEPRDKELYPLTSLKSLFGSDPLSQS
```

Fig. 77B

2003_CON_04_CFX gag.OPT

```
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGCGCATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGCTGATGG
AGCAGCTGCAGTCCACCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTTCAACACCATCGCCACCCTGTGGTGCGTGCACCAGCGCATC
GACGTGAAGGACACCAAGGAGGCCCTGGACAAGGTGGAGGAGATGCAGAACAAGTCCAAGCAGAAGACCCAGCAGGCCGCCGCCGACACCGG
CGGCTCCTCCAACGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGTCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGC
CCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGTGCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGTCCATCCTGAAGGCCCTGG
GCACCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCTCCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCTCCAACGCCGCCGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCCGCATGTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCC
GCCGAGTCCCTGGAGATGAAGGAGGAGACCACCTCCTCCCCCAAGCAGGAGCCCCGCGACAAGGAGCTGTACCCCCTGACCTCCCTGAAGTC
CCTGTTCGGCTCCGACCCCCTGTCCCAGTAA
```

Fig. 78A

19. 2003_CON_06_CPX_gag.PEP

MGARASVLSGGKLDEWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETAEGCQQIIEQLQSALKTGSEELKSLYNTVATLYCVHQRI
KVTDTKEALDKIEEIQNKSKQKAQQAAAATGNSSNLSQNYPIVQNAQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKNWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMS
QASGTEAAIMMQKSNFKGPKRSIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPP
AESFGFGEETAPSPKQEPKEKELYPLASLKSLFGNDP$

Fig. 78B

2003_CON_06_CPX_gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATCG
AGCAGCTGCAGTCCGCCCTGAAGACCGGCTCCGAGGAGCTGAAGTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCAGCGCATC
AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGGCCCAGCAGGCCGCCGCCGCCACCGG
CAACTCCTCCAACCTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCCCGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCTCCAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCCGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCTCCGGCACCGAGGCCGCCATCATGATGCAGAAGTCCAACTTCAAGGGCCCCAAGCGCTCCATCAAGTGCTTCAACTGCGGCAAGGA
GGGCCACCTGGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGC
GCCAGGCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCC
GCCGAGTCCTTCGGCTTCGGCGAGGAGGAGACCGCCTCCCCCAAGCAGGAGCCCAAGGAGAAGGAGCTGTACCCCCTGGCCTCCCTGAAGTC
CCTGTTCGGCAACGACCCCTAA

Fig. 79A

20. 2003_CON_07_BC_gag.PEP

MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLFNTVATLYCVHTEI
DVRDTKEALDKIEEEQNKIQQKTQQAKEADGKVSQNYPIVQNLQGQMVHQPISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTM
LNTVGGHQAAMQILKDTINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTSNPPVPVGDIYKRWIILGLNKIVRMYSP
TSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGASIEEMMTACQGVGGPSHKARVLAEAMSQTN
STILMQRSNFKGSKRIVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESFRF
GEETTTPSQKQEPIDKELYPLTSLKSLFGNDPSSQ$

Fig. 79B

2003_CON_07_BC_gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACACCGAGATC
GACGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGATCCAGCAGAAGACCCAGCAGGCCAAGGAGGCCGACGG
CAAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGCCCATCTCCCCCCGGCGCCACCCTGAACGCCTGGTGA
AGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATG
CTGAACACCGTGGGCGGCCATCGCCCCCCCGTGGGCCGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCAACCTGCAGGAGCAGATCGCCT
GGATGACCTCCAACCCCCCGTGCCCGTGGGCGACATCTACAAGCGCTGGATCATCCTGGGCCTCTTCAAGACCCTGCGCGCGCCCCTGGGCCCCGGCG
ACCTCCATCCTGGACATCAAGCAGGGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCTCCATCGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCATGTCGGCGGCCATGTCGGCCAAGGCCAAGGCCGTGCTGGCCGAAGCTGCTGGCCGAAGCCGT
TCCACCATCCTGATGCAGCGCTCCAACTTCAAGGGCTCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCCGCAA
CTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCCGAGGAGTCCTTCCGCTTC
GGCGAGGAGACCACCACCCCCTCCCAGAAGCAGGAGCCCATCGACAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTCCTCCCAGTAA

Fig. 80A

21. 2003_CON_08_BC gag.PEP

MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIIKQLQPALQTGTEELRSLFNTVATLYCVHAEI
EVRDTKEALDKIEEEQNKIQQKTQQAKEADEKVSQNYPIVQNLQGQMVHQPLSPRTLNAWVKVVEEKAFSPEVIPMFTALSEGATPQDLNTM
LNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSP
TSILDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQTN
NTILMQRSNFKGSKRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAESFRE
EETTPAPKQEPKDREPLTSLRSLFGSDPLSQ$

Fig. 80B

2003_CON_08_BC gag.OPT

ATGGGCGCCCGCGCCTCCATCCTGCGCGGCGGCAAGCTGGACAAGTGGGAGAAGATCCGCCTGCGCGGCGGCAAGAAGCACTACATGCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCA
AGCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGCTGCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACGCCGAGATC
GAGGTGCGCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGAACAAGATCCAGCAGAAGACCCAGCAGGCCAAGGAGGCCGACGA
GAAGGTGTCCCAGAACTACCCCATCGTGCAGGACCTGCAGGGCCAGATGGTGCACCAGCCCCTGTCCCCCCGCACCCTGAACGCCTGGGTGA
AGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCACCGCCCTGTCCGAGGGCTGCAAGGAGCGCCACCCCCAGGACCTGAACACCATG
CTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGT
GCACGCCGGCCCCGTGGCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGCAGATCGGCT
GGATGACCAACAACCCCCCCATCCCCGTGGGCGAGATCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCC
ACCTCCATCCTGGACATCAAGCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCAGGCCAC
CCAGGACGTGAAGAACTGGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGCGCGCCCTGGGCCCCGGCG
CCTCCCTGGAGGAGATGATGACCGCCTGCCAAGGGCGTGGGCGGCCCCTCCCACAAGGCTCGCGTGCTGGCCGAGGCCATGTCCCAGACCAAC
AACACCATCCTGATGCAGCGCTCCAACTTCAAGGGCTCCAAGCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCAAGAA
CTGCCGCGCCCCTGATGCCGCCGCTCCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCGCCGAGTCCTTCCGCTTC
GCAAGATCTGGCCCTCCCACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCGCCGAGTCCTTCCGCTTC
GAGGAGGAGACCACCCCCGCCCCCAAGCAGGAGCCCAAGGACCGCGAGCCCCTGACCTCCCTGCGCTCCCTGTTCGGCTCCGACCCCCTGTCCCA
GTAA

Fig. 81A

22. 2003_CON_10_CD gag.PEP

MGARASVLSGGKLDEWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCKQIIGQLQPAIQTGSEEIKSLYNTVATLYCVHERI
KVTDTKEALDKIEEEQTKSKKKAQQATADTGNSSQVSQNYPIVQNLQGQMVHQPLSPRTLNAWVKVIEEKAFSPEVIPMFSALSEGATPQDL
NTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVQAGPVAPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRM
YSPVSILDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNANPDCKTILKALGPAATLEEMTACQGVGGPSHKARVLAEAMS
QATSGNAIMMQRGNFKGPKKIIKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSNKGRPGNFLQSRPEPTAPPA
ESFGFGEEITPSQKQEQKDKELHPLASLKSLFGNDPLSQ$

Fig. 81B

2003_CON_10_CD gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGAGTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCAAGCAGATCATCG
GCCAGCTGCAGCCCGCCATCCAGACCGGCTCCGAGGAGATCAAGTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACGAGCGCATC
AAGGTGACCGACACCAAGGAGGCCCTGGACAAGATCGAGGAGGAGCAGACCAAGTCCAAGAAGAAGGCCCAGCAGGCCACGGCCACCGACGG
CAACTCCTCCCAGGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGCCCCTGTCCCCGCACCCTGAACG
CCTGGGTGAAGGTGATCGAGGAGAAGGCCTTCTCCCCGGAGGTGATCCCGAGGTGAAGCAGCGCCATCCGCGGCGACAGATCCGCCGGCTG
AACACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATCCGCCGCGGCCAGCTGCCCGAGCTCCGAGGAGGAGGCCGCCGCCT
GCACCCCGTGCAGGCCGGCCCCGTGGCCCCCGGCCAGATCCGCGAGCCCCGTGGGCCCCAGGACCCCTGGCCTCCCCGACCGCAGGAGC
AGATCCGCTGGATGACCTCCATCCTGGACAGTGAAGAGAACTGGGCGCTTCTACAAGCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTACAAGACCCTGCGCGCCGA
GCAGGCCTCCCAGGACGTGAAGAACTGGATGACCGAGACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGG
GCCCCGCCGCCACCCTGGAGGAGATGACCGCCTGCCAGGGCGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCC
CAGGCCACCTCCGGCAACGCCATCATGATGCAGCGCGGCAACTTCAAGGGCCCCAAGAAGATCATCAAGTGCTTCAACTGCGGCAAGGAGGG
CCACATCGCCAAGAACTGCCGCGCCCCGCGCAAGAAGGGCTGCTGGAAGTGCGGCGAGGGCCACCAGATGAAGGACTGCACCGAGCGCC
AGGCCAACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCCCGCC
GAGTCCTTCGGCTTCGGCGAGGAGATCACCCCCTCCCAGAAGCAGGAGCAGAAGGACAAGGAGCTGCACCCCCTGGCCTCCCTGAAGTCCCT
GTTCGGCAACGACCCCCTGTCCCAGTAA

Fig. 82A

23. 2003_CON_11_CPX gag.PEP
gag.PEPMGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPSLLETAEGCQQIMGQLQPALGTGTEELRSLYNTVATL
YCVHHRIEVKDTKEALDKIEEIQNKSKQKKQQAAADTGNSSKVSQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSE
GATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIGWMTGNPPVPVGEIYRRWIILG
LNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKSWMTETLLIQNANPDCKSILRALGPGATLEEMMTACQGVGGPGHKAR
VLAEAMSQVQQTNIMMQRSNFKGQKRIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSSKGRPGNFLQSRPEP
TAPPAESFGFGEEIAPSPKQEPKEKELYPLTSLKSLFGSDPLSQ$

Fig. 82B

2003_CON_11_CPX gag.OPT
ATGGGCGCCCGCGCCTCCGTCCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCCGGCGGCAAGAAGAAGTACCGCCT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCTCCCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGGGCACCGGCACCGAGGAGCTGCGCTCCCTGTACAACACCGTGGCCACCCTGTACTGCGTGCACCACCGCATC
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGATCGAGGAGATCCAGAACAAGTCCAAGCAGAAGAAGCAGCAGGCCGCCGCAGCACCGG
CAACTCCTCCAAGGTGTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCCCGCACCCTGAACG
CCTGGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCCGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTG
AACATGATGCTGAACATCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCGT
GCACCCCGTGCACGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGCGGCTCCGACATCGCCGGCACCACCTCCACCCTGCAGGAGC
AGATCGGCTGGATGACCGGCAACCCGCCTGTGCCCGTGGGCGAGATCTACCGCCGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATG
TACTCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGA
GCAGGCCACCCAGGAGGTGAAGTCCTGGATGACCGAGACCCTGCTGATCCAGAACGCCAACCCCGACTGCAAGTCCATCCTGCGCGCCCTGG
GCCCCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCAGGGCCATCAAGGCGCGCGTGCTGGCCGAGGCCATGTCC
CAGGTGCAGCAGACCAACATCATGATGCAGCGCAGAAGGGCTGCGGCAAGGGCCATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCTCCAAGGGCCGCCCCGGCAACTTCCTGCAGTCCCGCCCCGAGCCCACCGCCCCCGCCGAGTCC
TTCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGCCCAAGGAGAAGGAGCTGTACCCCCTGACCTCCCTGAAGTCCCTGTTCGG
CTCCGACCCCCTGTCCCAGTAA

Fig. 83A

24. 2003_CON_12_BF.gag.PEP

MGARASVLSGGELDRWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETSEGCRKIIGQLQPSLQTGSEELRSLYNTIAVLYFVHQKV
EVKDTKEALDKLEEEQNKSQQKTQQAAADKGVSQNYPIVQNLQGQMVHQALSPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTML
NTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIPPGQMREPRGSDIAGTTSTLQEIQWMTSNPPVPVGEIYKRWIILGLNKIVRMYSPV
SILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILKALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQVTN
TTVMMQKSNFKGQRRIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQANFLGKIWPSNKGRPGNFLQNRPEPTAPPAESFGF
GEEITPSPKQEQKDEGLYPPLASLKSLFGNDP$

Fig. 83B

2003_CON_12_BF.gag.OPT

ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCGAGCTGGACCGCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCCT
GAAGCACATCGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCGTGAACCCCGGCCTGCTGGAGACCTCCGAGGGCTGCCGCAAGATCATCG
GCCAGCTGCAGCCCTCCCTGCAGACCGGCTCCGAGGAGCTGCGCTCCCTGTACAACACCATCGCCGTGCTGTACTTCGTGCACCAGAAGGTG
GAGGTGAAGGACACCAAGGAGGCCCTGGACAAGCTGGAGGAGGAGCAGAACAAGTCCCAGCAGAAGACCCAGCAGGCCGCCGCCGACAAGGG
CGTGTCCCAGAACTACCCCATCGTGCAGAACCTGCAGGGCCAGATGGTGCACCAGGCCCTGTCCCCGCGCACCCCCAGGACCCTGAACGCCTGG
GTGAAGG
TGGTGGAGGAGAAGGCCTTCTCCCCGGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAACACCATGCTG
AACACCGTGGGCGGCCATCCCCCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCCTGCACCCCGTGCA
CGCCGGCCCCATCCCCCCCGGCCAGATGCGCGAGCCCCGGGGCTCCGACATCGCTGGAGCTGGATCATCCTGGGCCTGAACAAGATCGTGCGCATGTACTCCCCCGTG
TGACCTTCCAACCCCGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCATCCTGCGCGAGCAGGCCACCCA
TCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCATCCTGCGCGAGCAGGCCACCCA
GGAGGTGAAGGGCTGGATGATGACCGACACCCTGCTGGTGCAGAACGCCAACCCCGACTGCAAGACCATCCTGAAGGCCCTGGGCCCGGGCGCCA
CCCTGGAGGAGATGATGACCGCCTGCCAGGGCGTGGGCGGCCCGGGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAGGTGACCAAC
ACCACCGTGATGATGCAGAAGTCCAACTTCAAGGGCCAGCGCCGCATCGTGAAGTGCTTCAACTGCGGCAAGGAGGGCCACATCGCCAAGAA
CTGCCGCGCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCCGCGAGGGCCACCAGATGAAGGACTGCACCGAGCGCCCCCAGGCCAACTTCCTGG
GCAAGATCTGGCCCTCCAACAAGGGCCCCCGCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCTGCCCCCGCCGAGTCCTTCGGCTTC
GGCGAGGAGATCACCCCCTCCCCCAAGCAGGAGCAGAAGGACGAGGGCCTGTACCCCCCCCTGGCCTCCCTGAAGTCCCTGTTCGGCAACGA
CCCCTAA

Fig. 84A

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25. 2003_CON_14_BG_gag.PEP
MGARASVLSGGKLDAWEKIRLRPGGKKKYRMKHLVWASRELERFALNPDLLETAEGCQQIMGQLQPALQTGTEEIRSLFNTVATLYCVHQKI
EVKDTKEALEEVEKAQKKSQKKQQAAMDEGNNSQASQNYPIVQNAQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLN
TMLNTVGGHQAAMQMLKDTINEEAAEWDRMHPQQAGPIPPGQIREPRGSDIAGTTSTLQEQIRWMTSNPPIPVGEIYKRWIILGLNKIVRMY
SPVSILDIRQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQVGGPSHKARVLAEAMSQ
ASGATIMMQKSNFKGPRRNIKCFNCGKEGHLARNCRAPRKKGCWKCGKEGHQMKDCTESKANFLGKIWPSNKGRPGNFLQNRPEPTAPPAES
FGFGEEIAPSPKQEPKEKEIYPLASLKSLFGSDP$SQ$
```

Fig. 84B

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2003_CON_14_BG_gag.OPT
ATGGGCGCCCGCGCCTCCGTGCTGTCCGGCGGCAAGCTGGACGCCTGGGAGAAGATCCGCCTGCGCCCGGGCGGCAAGAAGAAGTACCGCAT
GAAGCACCTGGTGTGGGCCTCCCGCGAGCTGGAGCGCTTCGCCCTGAACCCCGACCTGCTGGAGACCGCCGAGGGCTGCCAGCAGATCATGG
GCCAGCTGCAGCCCGCCCTGCAGACCGGCACCGAGGAGATCCGCTCCCTGTTCAACACCGTGGCCACCCTGTACTGCGTGCACCAGAAGATC
GAGGTGAAGGACACCAAGGAGGCCCTGGAGGAGGTGGAGAAGGCCCAGAAGAAGTCCCAGAAGAAGCAGCAGGCCGCCATGGACGAGGGCAA
CAACTCCCAGGCCTCCCAGAACTACCCCATCGTGCAGAACGCCCAGGGCCAGATGGTGCACCAGGCCATCTCCCCGCGCACCCTGAACGCCT
GGGTGAAGGTGGTGGAGGAGAAGGCCTTCTCCCCGGAGGTGATCCCCATGTTCTCCGCCCTGTCCGAGGGCGCCACCCCCCAGGACCTGAAC
ACCATGCTGAACACCGTGGGCGGCCACCAGGCCGCCATGCAGATGCTGAAGGACACCATCAACGAGGAGGCCGCCGAGTGGGACCGCATGCA
CCCCCAGCAGGCCGGCCCCATCCCCCCCGGCCAGATCCGCGAGCCCCGTGGGCGGCAGATCTACAAGCGCTGGACCGCTTCTTCAAGACCCTG
TCCCCCGTGTCCATCCTGGACATCCGCCAGGGCCCCAAGGAGCCCTTCCGCGACTACGTGGACCGCTTCTTCAAGACCCTGCGCGCCGAGCA
GGCCACCCAGGAGGTGAAGGGCTGGATGACCGACACCCTGCTGGTGCAGAACGCCCCTCCCACAAGGCCATCCTGCGCGCCCTGGGCC
CCGGCGCCACCCTGGAGGAGATGATGACCGCCTGCCAGGTGGGCGGCCCCAGCCACAAGGCCCGCGTGCTGGCCGAGGCCATGTCCCAG
GCCTCCGGCGCCACCATCATGATGCAGAAGTCCAACTTCAAGGGCCCCCGCCGCAACATCAAGTGCTTCAACTGCGGCAAGGAGGGCCACCT
GGCCCGCAACTGCCGCGCCCCCCGCAAGAAGGGCTGCTGGAAGTGCGGCAAGGAGGGCCACCAGATGAAGGACTGCACCGAGTCCAAGGCCA
ACTTCCTGGGCAAGATCTGGCCCTCCAACAAGGGCCGCCCCGGCAACTTCCTGCAGAACCGCCCCGAGCCCACCGCCCCCCCGAGTCC
TTCGGCTTCGGCGAGGAGATCGCCCCCTCCCCCAAGCAGGAGCCCAAGGAGAAGGAGATCTACCCCCTGGCCTCCCTGAAGTCCCTGTTCGG
CTCCGACCCCTAATCCCAGTAA
```

Fig. 85A

31. 2003_CONS nef.PEP

MGGKWSKSSIVGWPAVRERIRRTPPAAEGVGAVSQDLDKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKGAFDLSHFLK
EKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEEANEGENNCLLHPMCQHGMEDEDREVLMWK
FDSRLALRHIARELHPEFYKDC$

Fig. 85B

2003_CONS nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGCACCCCCCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 86A

32. 2003_M._GROUP.anc nef.PEP

MGGKWSKSSIVGWPAVRERMRRTAPAAEGVGAVSQDLDKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAAFDLSHFLK
EKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEEANEGENNCLLHPMCQHGMEDEEREVLMWK
FDSRLALRHIARELHPEFYKDC$

Fig. 86B

2003_M_GROUP.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATGCGCCGCACCGCCCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 87A

33. 2003_CON_A nef.PEP

MGGKWSKSSIVGWPDIRERIRRTPPAAKGVGAVSQDLDKYGAVTINNTAATQASCAWLEAQEEEEVGFPVRPQVPLRPMTFKGAFDLSFFL
KEKGGLDGLIYSQKRQEILDLWVYNTQGYFPDWQNYTPGPGTRFPLTFGWCFKLVPVDPDEVEEATEGENNCLLHPICQHGMDDEEKEVLMW
KFDSRLARRHIALEMHPEFYKDC$

Fig. 87B

2003_CON_A nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGACATCCGCGAGCGCATCCGCCGCACCCCCCCCGCCGCCAAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGTACGGCGCCGTGACCATCAACAACACGGCCGCCACCCAGGCCTCCTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCCAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCACCCGCTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGACGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGAAGGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCCGCCGCCACATCGCCCTGGAGATGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 88A

34. 2003_CON_A1 nef.PEP

MGGKWSKSSIVGWPEVRERMRRTPPAATGVGAVSQDLDKHGAVTSSNINHPSCVWLEAQEEEEVGFPVRPQVPLRPMTYKGALDLSHFLKEK
GGLDGLIYSRKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPDEVEKATEGENNSLLHPICQHGMDDEEREVLKWKFD
SRLALKHRAQELHPEFYKDC$

Fig. 88B

2003_CON_A1 nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATGCGCCGCACCCCCCCCGCCGCCACCGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACATCAACCACCCCTCCTGCGTGTGGCTGGAGGCCCAGGAGGAGG
AGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCCTGGACCTGTCCCACTTCCTGAAGGAGAAG
GGCGGCCTGGACGGCCTGATCTACTCCCGCAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGACTGGCA
GAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGACGAGGTGGAGAAGG
CCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGCGCGAGGTGCTGAAGTGGAAGTTCGAC
TCCCGCCTGGCCCTGAAGCACCGCGCCCAGGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 88C

35. 2003_A1.anc nef.PEP
MGGKWSKSSIVGWPEVRERMRRTPPAAKGVGAVSQDLDKHGAVTSSNTAANNPGCAWLEAQEEEVGFPVRPQVPLRPMTYKGAFDLSHFLK
EKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPAEVEEATEGENNSLLHPICQHGMDDEEREVLMWK
FDSRLALKHRARELHPEFYKDC$

Fig. 88D

2003_A1.anc nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGAGGCGCATGCGCCCCCCCGCCGCCAAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACACCGCCGCCAACAACCCCGGCTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGCCGAGGTGG
AGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGGAGAGGGAGGTGCTGATGTGGAAG
TTCGACTCCCGCCTGGCCCTGAAGCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 89A

36. 2003_CON_A2 nef.PEP
MGGKWSKSSIVGWPAIRERMRKRTPPAAEGVGAVSQDLATRGAVTSSNTAATNPDCAWLEAQEEEVGFPVRPQVPLRPMTFKGAFDLSHFL
KEKGGLDGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGTRYPLTFGWCFKLVPVDPSEVEEATEGENNSLLHPICQHGIEDPEREVLRW
KFDSRLALRHRARELHPEFYKDC$

Fig. 89B

2003_CON_A2 nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATGCGCAAGCGCACCCCCCCGCCGAGGGCGT
GGGCGCCGTGTCCCAGGACCTGGCCACCCGCGGCGCCGTGACCTCCTCCAACACCGCCGCCACCAACCCCGACTGCGCCTGGCTGGAGGCCC
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACACCCGGCACCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCTCCGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATCGAGGACCCCGAGCGCGAGGTGCTGCGCTGG
AAGTTCGACTCCCGCCTGGCCCTGCGCCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 90A

37. 2003_CON_B nef.PEP

MGGKWSKRSVVGWPTVRERMRRAEPAADGVGAVSRDLEKHGAITSSNTAANNADCAWLEAQEEEVGFPVRPQVPLRPMTYKGALDLSHFLK
EKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGIRYPLTFGWCFKLVPVEPEKVEEANEGENNSLLHPMSLHGMDDPEREVLVWK
FDSRLAFHHMARELHPEYYKDC$

Fig. 90B

2003_CON-B nef.OPT

ATGGGCGGCAAGTGGTCCAAGAGGCTCCGTGGTGGGGCTGGCCGACCGTGCCGCTGGCCGGAGCGGCCATGCGCCGCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCGCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCCTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGAGAAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATGTCCCTGCACGGCATGGACGACCCCGAGCGCGAGGTGCTGGTGTGGAAG
TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 90C

38. 2003_B.anc nef.PEP

MGGKWSKSSMGGWPAVRERMKRAEPAADGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAALDLSHFLK
EKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGIRYPLTFGWCFKLVPVEPEKVEEATEGENNSLLHPMCQHGMDDPEKEVLVWK
FDSRLAFHHMARELHPEYYKDC$

Fig. 90D

2003_B.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATGGGCGGCTGGCCCGCCGTGCGCGAGCGCATGAAGCGCGCCGAGGCCCCGCCGCTGACGGCGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACGAACGCCGACTGCGCCTGCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCGCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCCAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACACCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGAGCCCGAGAAGGTGG
AGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCGTGCCAGCACGGCATGGACGACCCCGAGAAGGAGGTGCTGGTGTGGAAG
TTCGACTCCCGCCTGGCCTTCCACCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 91A

39. 2003_CON_02_AG_nef.PEP
MGGKWSKSSIVGWPKVRERIRQTPPAATGVGAASQDLDRHGAITSSNTAATNADCAWLEAQEEEVGFPVRPQVPLRPMTYKAAVDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGTREFPLTFGWCFKLVPMDPAEVEEANEGENNSLLHPICQHGMEDEDREVLVWR
FDSSLAFKHRARELHPEFYKDC$

Fig. 91B

2003_CON_02_AG_nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCAAGGTGCGCGAGCGGATCCGGCAGACCCCCCCCGCCGCACCGGCGTGGG
CGCCGGCCTCCCAGGACCTGGACCGCCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCGTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTTCTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCACCCGCGAGTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCATGGACCCCGCCGAGGTGG
AGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGGTGTGGCGC
TTCGACTCCTCCCTGGCCTTCAAGCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 92A

40. 2003_CON_C_nef.PEP
MGGKWSKSSIVGWPAVRERIRRTEPAAEGVGAASQDLDKHGALTSSNTATNNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKAAFDLSFFL
KEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGVRYPLTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKW
KFDSHLARRHMARELHPEYYKDC$

Fig. 92B

2003_CON_C_nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGCACCGAGCCCGCCGCCGAGGGCGTGGG
CGCCGCCTCCCAGGACCTGGACAAGCACGGCGCCCTCACCTCCTCCAACACCGCCACCAACAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCGTGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGG
AAGTTCGACTCCCACCTGGCCCGCCGCCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

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Fig. 92C

41. 2003 C.anc nef.PEP

MGGKWSKSSIVGWPAVRERMRRTEPAAEGVGAASQDLDKHGALTSSNTAANNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKAAFDLSFFL
KEKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGVRYPLTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMEDEDREVLKW
KFDSHLARRHMARELHPEYYKDC$

Fig. 92D

2003 C.anc nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGTGCGCGAGCGCATGCGCCGCACCGAGCCCGCCGAGGGCGTGGG
CGCCGCCTCCCAGGACCTGGACAAGCACGGCGCCCTGACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCGTGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGG
AAGTTCGACTCCCACCTGGCCCGCCGCCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 93A

42. 2003 CON D nef.PEP

MGGKWSKSSIVGWPAIRERIRRTEPAADGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEDEEVGFPVRPQVPLRPMTYKAALDLSHFL
KEKGGLEGLIWSQKRQEILDLWVYNTQGFFPDWQNYTPGPGIRYPLTFGWCFELVPVDPEEVEEATEGENNCLLHPMCQHGMEDPEREVLMW
RFNSRLAFEHKARVLHPEFYKDC$

Fig. 93B

2003 CON D nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGCACCGAGGCCGCCGACGGCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACGCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGACGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCCTGGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTGGTCCCAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCGAGCTGGTGCCCGTGGACCCCGAGGAG
GTGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCATGGAGGACCCCGAGCGCGAGGTGCTGATGTGG
CGCTTCAACTCCCGCCTGGCCTTCGAGCACAAGGCCCGCGTGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 94A

43. 2003_CON F1 nef.PEP
MGGKWSKSSIVGWPAVRERMRPTPPAAEGVGAVSQDLERRGAITSSNTGATNPDLAWLEAQEEEVGFPVRPQVPLRPMTYKGAVDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDPEEVEKANEGENNCLLHPMSQHGMEDEDREVLIWK
FDSRLALRHIARERHPEFYQD$

Fig. 94B

2003_CON F1 nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATGCGCCCCACCCCCCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGAGCGCCGCGGCGCCATCACCTCCTCCAACACCGGCGCCACCAACCCCGACCTGGCCTGGCTGGAGGCCCAGG
AGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCGTGGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGAAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGATCTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCGCCACCCCGAGTTCTACCAGGACTAA

Fig. 95A

44. 2003_CON F2 nef.PEP
MGGKWSKSSIVGWPTIRERIRRTPVAAEGVGAVSQDLDKHGAITSSNTRATNADLAWLEAQEDEEVGFPVRPQVPLRPMTYKAAFDLSHFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGTRYPLTFGWCFKLVPVDPEEVEKANEGENNCLLHPMSLHGMEDEDREVLKWK
FDSRLALRHIARERHPEYYKD$

Fig. 95B

2003_CON F2 nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCACCATCCGCGAGCGCATCCGCCGCACCCCCGTGGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCCGCGCCACCAACGCCGACCTGGCCTGGCTGGAGGCCCAGG
AGGACGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGCCGCCTTCGACCTGTCCCACTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCAGAACTACACCCCCGGCCCCGGCACCCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCGAGGAGGTGG
AGAAGGCCAACGAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCTGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGAAGTGGAAG
TTCGACTCCCGCCTGGCCCTGCGCCACATCGCCCGCGAGCGCCACCCCGAGTACTACAAGGACTAA

Fig. 96A

45. 2003_CON_G nef.PEP
MGGKWSKSSIVGWPEVRERIRQTPPAAEGVGAVSQDLARHGAITSSNTAANNPDCAWLEAQEEDSEVGFPVRPQVPLRPMTYKGAFDLSFFL
KEKGGLDGLIYSKKRQDILDLWVYNTQGFEPDWQNYTPGPGTRFPLTFGWCFKLVPMDPAEVEEANKGENNSLLHPICQHGMEDEDREVLVW
RFDSSLARRHIARELHPEYYKDC$

Fig. 96B

2003_CON_G nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATCCGCCAGACCCCCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGCCCGCCATCACCTCCAACACCGCCGCCAACAACCCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGACTCCGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTCCC
CGACTGGCAGAACTACACACCCCCGGCCCCGGCACCCGCTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCATGGACCCCGCCGAGG
TGGAGGAGGCCAACAAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGAGGACCGCGAGGTGCTGGTGTGG
CGCTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 97A

46. 2003_CON_H nef.PEP
MGGKWSKSSIGGWPAIRERIRRAEPAAEGVGAVSRDLDRRGAVTINNTASTNPDSAWLEAQEEEEVGFPVRPQVPLRPMTYKGAFDLSHFL
KEKGGLEGLIYSKKRQEILDLWVYNTQGYFPDWQNYTPGPGERYPLTFGWCFKLVPVDPQEVEKANEGENNSLLHPICQHGMEDEEREVLMW
KFDSRLAFRHIARELHPEFYKDC$

Fig. 97B

2003_CON_H nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGGCGGCTGGCCCGCCATCCGCGAGCGCATCCGCCGCGCCGAGCCCGCCGCCGAGGGCGTGGG
CGCCGTGTCCCGCGACCTGGACCGCCGCGGCGCCGTGACCATCAACAACACCGCCTCCACCAACCCCGACTCCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACACCCCCGGCCCCGGCGAGCGCTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCAGGAGG
TGGAGAAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGAGGAGCGCGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCTTCCGCCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 98A

47. 2003_CON_01_AE_nef.PEP

MGGKWSKSSIVGWPQVRERIKQTPPATEGVGAVSQDLDKHGAVTSSNMNNADCVWLRAQEEEVGFPVRPQVPLRPMTYKGAFDLSFFLKEK
GGLDGLIYSKKRQEILDLWVYNTQGFFPDWQNYTPGPGIRYPLCFGWCFKLVPVDPREVEEDNKGENNCLLHPMSQHGIEDEEREVLMWKFD
SALARKHIARELHPEYYKDC$

Fig. 98B

2003_CON_01_AE_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGCATCAAGCAGACCCCCCCGGCCACCGAGGGCGTGGG
CGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCGTGACCTCCTCCAACATGAACAACGCCGACTGCGTGTGGCTGCGCGCCCAGGAGGAGG
AGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTGAAGGAGAAG
GGCGGCCTGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCCCGACTGGCA
GAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGTGCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGAGTGGAGGAGG
ACAACAAGGGCGAGAACAACTGCCTGCTGCACCCCATGTCCCAGCACGGCATCGAGGACGAGGAGCGCGAGGTGCTGATGTGGAAGTTCGAC
TCCGCCCTGGCCCGCAAGCACATCGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 99A

48. 2003_CON_03_AE_nef.PEP

MGGKWSKSSIVGWPQVRERIRRAPAPAARGVGPVSQDLDKYGAVTSSNTAANNADCAWLEAQKEEEVGFPVRPQVPLRPMTYKGAFDLSHFL
KEKGGLDGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRFPLTFGWCYKLVPVDPDEVEEATEGENNSLLHPICQHGMDDEKEVLMW
KFDSRLALTHRARELHPEFYKDC$

Fig. 99B

2003_CON_03_AE_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGCATCCGCCGCGCCCCCGCCCCCGCCGCCCGCGGCGT
GGGCCCCGTGTCCCAGGACCTGGACAAGTACGGCGCCGTGACCTCCTCCAACACCGCCGCCAACAACGCCGACTGCGCCTGGCTGGAGGCCC
AGAAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCCACTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTTCCCCCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCGACGAGG
TGGAGGAGGCCACCGAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGACGACGAGAAGGAGGTGCTGATGTGG
AAGTTCGACTCCCGCCTGGCCCTGACCCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

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Fig. 100A

49. 2003_CON_04_CFX_nef.PEP
MGGKWSKSSIVGWPAIRERMRQRGPAQAEPAAAGVGAVSQDLDKHGAITSSNTAATNPDKAWLEAQEEEEVGFPVRPQVPLRPMTFKAALD
LSHFLKEKGGLDGLIYSKKRQEILDLWVYNTQGYFPDWQNYTPGPGEREFPLCFGWCFKLVPVDPQEVEEATEGENNCLLHPISQHGMEDEER
EVLKWKFDSRLAYKHIARELHPEFYKDC$

Fig. 100B

2003_CON_04_CFX_nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCATCCGCGAGCGCATGCGCCAGCGCGGCCCCGAGCCCGC
CGCCGCCGGCGTGGGCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCACCAACCCCGACAAGGCCT
GGCTGGAGGCCCAGGAGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGCCGCCCTGGAC
CTGTCCCACTTCCTGAAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACAACAC
CCAGGGCTACTTCCCCGACTGGCAGAACTACACACCCCCGGCCCCGGCGAGCGCTTCCCCCTGTGCTTCGGCTGGTGCTTCAAGCTGGTGCCCG
TGGACCCCCAGGAGGTGGAGGAGGCCACCGAGGGCGAGAACAACTGCCTGCTGCACCCCATCTCCCAGCACGGCATGGAGGACGAGGAGCGC
GAGGTGCTGAAGTGGAAGTTCGACTCCCGCCTGGCCTACAAGCACATCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 101A

50. 2003_CON_06_CFX_nef.PEP
MGGKWSKSSIVGWPQVRERMRNPPTEGAAEGVGAVSQDLDKHGAITSSNTATTNAACAWLEAQTEDEVGFPVRPQVPLRPMTYKGAFDLSFF
LKEKGGLDGLIYSKKRQEILDLWVYHTQGPGIRYPLTFGWCYKLVPVDPKEVEEDTKGENNCLLHPMCQHGVEDEEREVLM
WKFDSSLARRHIAREMHPEFYKDC$

Fig. 101B

2003_CON_06_CFX_nef.OPT
ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCCAGGTGCGCGAGCGCATGCGCAACCCCCCCACCGAGGGCGCCGCCGAGGGG
CGTGGGCGCCGTGTCCCAGGACCTGGACAAGCACGGCGCCATCACCTCCTCCAACACCGCCACCACCAACGCCGCCTGCGCCTGGCTGGAGG
CCCAGACCGAGGACGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTC
CTGAAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTTCTT
CCCCGACTGGCAGAACTACACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCAAGG
AGGTGGAGGAGGACACCAAGGGCGAGAACAACTGCCTGCTGCACCCCATGTGCCAGCACGGCGTGGAGGACGAGGAGCGCGAGGTGCTGATG
TGGAAGTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGATGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 102A

51. 2003 CON 08 BC nef.PEP

MGGKWSKSSIVGWPAIRERIRRTEPAADGVGAVSRDLEKHGAITSSNTADTNADCAWLETQEEEVGFPVRPQVPLRPMTFKGALDLSFFLK
EKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWHNYTPGPGVRFPLTFGWCFKLVPVDPREVEEANEGEDNCLLHPVCQHGMEDEHREVLKWK
FDSQLAHRHRARELHPEFYKDC$

Fig. 102B

2003 CON 08 BC nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGGCCATCCGCGAGCGCATCCGCCGGACGGCCGTGGG
CGCCGTGTCCCGCGACCTGGAGAAGCACGGCGCCATCACCTCCTCCAACACCGCCGACACCAACGCCGACACCAACGCCGACTGCGCCTGGCTGGAGACCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTTCAAGGGCGCCCTGGACCTGTCCTTCTTCCTGAAG
GAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGAAGCGCCAGGAGATCCTGGACCTGTGGGTGTACCACACCCAGGGCTACTTCCCCGA
CTGGCACAACTACACCCCCGGCCCCGGCGTGCGCTTCCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGTGCCCGTGGACCCCCGCGAGGTGG
AGGAGGCCAACGAGGGCGAGGACAACTGCCTGCTGCACCCCGTGTGCCAGCACGGCATGGAGGACGAGCACCGCGAGGTGCTGAAGTGGAAG
TTCGACTCCCAGCTGGCCCACCGCCACCGCGCCCGCGAGCTGCACCCCGAGTTCTACAAGGACTGCTAA

Fig. 103A

52. 2003 CON 10 CD nef.PEP

MGGKWSKSSIVGWPAVRERIRRTDPAAEGVGAASRDLEKYGAITSSNTAQTNPDCAWLEAQEEEEVGFPVRPQVPLRPMTYKGAFDLSFFL
KEKGGLEGLIYSKRRQDILDLWVYNTQGFFPDWQNYTPGPGIRYPLTFGWCYKLVPVDPREVEEANEGENNSLLHPMSLHGMEDPHGEVLMW
KFDSNLAHKHMARELHPEYYKDC$

Fig. 103B

2003 CON 10 CD nef.OPT

ATGGGCGGCAAGTGGTCCAAGTCCTCCATCGTGGGCTGGCCCGCCGTGCGCGAGCGCATCCGCCGGACCGACCCCGCCGCCGAGGGCGTGGG
CGCCGCCTCCCGCGACCTGGAGAAGTACGGCGCCATCACCTCCTCCAACACCGCCCAGACCAACCCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGAGGAGGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGAGGGCCTGATCTACTCCAAGCGCCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCATCCGCTACCCCCTGACCTTCGGCTGGTGCTACAAGCTGGTGCCCGTGGACCCCCGCGAGG
TGGAGGAGGCCAACGAGGGCGAGAACAACTCCCTGCTGCACCCCATGAGCCTGCACGGCATGGAGGACCCCCACGGCGAGGTGCTGATGTGG
AAGTTCGACTCCAACCTGGCCCACAAGCACATGGCCCGCGAGCTGCACCCCGAGTACTACAAGGACTGCTAA

Fig. 106A

55. 2003_CON_14_BG_nef.PEP

MGGKWSKCSIVGWPEVRERIRRTPPAAVGVGAVSQDLAKHGAITSSNTAANNPDCAWLEAQEEDSEVGFPVRPQVPLRPMTYKGAFDLSFFL
KEKGGLDGLIYSKQRQDILDLWVYNTQGFFPDWQNYTPGPGTRYPLTFGWCFKLEPVDPAEVEEATKGENNSLLHPICQHGMEDADNEVLIW
RFDSSLARRHIARELHPDFYKDC$

Fig. 106B

2003_CON_14_BG_nef.OPT

ATGGGCGGCAAGTGGTCCAAGTGCTCCATCGTGGGCTGGCCCGAGGTGCGCGAGCGCATCCGCCGCACCCCCCCGCCCGCTGGGCGTGGG
CGCCGTGTCCCAGGACCTGGCCAAGCACGGCGCCATCACCTCCTCCAACACCGCCGCCAACAACCCCGACTGCGCCTGGCTGGAGGCCCAGG
AGGAGGACTCCGAGTGGGCTTCCCCGTGCGCCCCCAGGTGCCCCTGCGCCCCATGACCTACAAGGGCGCCTTCGACCTGTCCTTCTTCCTG
AAGGAGAAGGGCGGCCTGGACGGCCTGATCTACTCCAAGCAGCGCCAGGACATCCTGGACCTGTGGGTGTACAACACCCAGGGCTTCTTCCCC
CGACTGGCAGAACTACACCCCCGGCCCCGGCACCCGGTACCCCCTGACCTTCGGCTGGTGCTTCAAGCTGGAGCCCGTGGACCCCGCCGAGG
TGGAGGAGGCCACCAAGGGCGAGAACAACTCCCTGCTGCACCCCATCTGCCAGCACGGCATGGAGGACGCCGACAACGAGGTGCTGATCTGG
CGCTTCGACTCCTCCCTGGCCCGCCGCCACATCGCCCGCGAGCTGCACCCCGACTTCTACAAGGACTGCTAA

Fig. 107A

61. 2003_2003_CON_S_pol.PEP

FFRENLAFQQGEAREFSSEQTRANSPTSRELRVRGGDNPLSEAGAERQGTVSLSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEEHEKYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

SUBSTITUTE SHEET (RULE 26)

Fig. 107B

2003_CON_s_pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCGCGTGCG
CGGCGGGACAACCCCCTGTCCGAGGCCGGCGCCGAGCGCCAGGCGCCAGGCGCACCGTCCCTGTCCCCAGATCACCCTGGTGACCG
TGAAGATCGGCGCGCCAGTCGGGCGGCTTCATCAAGGTGCGCCAGTACGACCCAGATCCTGATCGAGATCTGGGCGCAAGTGGAAGCCCAAGATG
ATCGGCGGGCATCGGCGGCTTCATCAAGGTGCGCCAACATGCTGCTGACCCAGAGATCCTGATCGGCGCAAGAGGCCATCGAGACCGTGCCCGTGGTGGCCCAC
CCCCGTGAACATCATCGGCGCGCAACATGCTGCTGACCCGAGGAGAAGCAGTCAAGGCCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
GCATGGACACGGCCCCAAGGTGAAGCAGTCGGCCCCTGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCATCTTCGCCAACAGAAGGACTCCACCAGTGGCGCAAGCTGGTGACTTCCGCGAGCTGAACAA
GCGCACCCAGGACTTCTGGGAGGTGCAGTGGCCATCCCCCACCCCCGGCCGTGGGGCGTGGGCGACGCCTACT
TCTCCGGTCCCCCCTGAGGACGAGGACTTCCGCGAGCTGGAGATCGGCCAAGTACGAGGAGATCGGCCAGTAGAACGTGCTG
CATGGACGACCTGTACGTGGGGCTCCGAGATCGGCCAGCAACGGCCACCTGCTGGGGCTTCACCACCC
CCGACAAGAAGCACCAGAGGAGGGCTCCCCCCCTTCCTGTGGATGGCTACGAGCTGAACTGGGCCTCCGAGAAGTGGACCTGCTGCG
TCCTGGACCGTGAACGACATCCAGAAGCTGGGTGCCCCTGACCGAGAAGCTGGAGGAGCCCTTCAAGAACCTGAAGACC
CGGGCCAAGGCCCTGACCGAGCATCTGCCCTGACCGAGATCCTGATCGTGGGGAGTTCGTGAACA
ACTACGACGACCCCTCCAAGGACACCTGATCGCCGAGATCTACCAGATCTACCAGGAGATCTACCAGAGAAGACCTGAAGACC
GGCAAGTACGGCGGTACGTGCCTCCGCCCACACCAACGACGTGAAGCAGCCGTGCAGGAGGCCGTGATCTGGGGCAA
GACCCCCAAGTCCCTGGTGAACATCGTGCCTGCCCATCCAGAGAAGGAGACCTGGTGACCGTGAAACCGGCCATCCCCACCTGGCCCT
CCCCCCCCTGGTGAAGCTGTGGTACAGCTGGAAGGAGGCCGTGGAACCGGCCAACCGCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGGCGGCGGGCCCAGAAGGTGGTACCTGTCCTGGGTGTCCCTGGTGCCCCTGTGCGAGCTGGTGAACC
GCAGGACTCCGGCTGATCAAGAAGACTGAACATCGTTACCTGCGCATCATCGACAAGCTGCCCAGTGGTGTCC
AGATCATCGAGCAGGCTGATCAAGAAGAGAAGGCCAGAGAAGTGCCAGGGCCATGTGCGACTGCTCTCCCCCGGCATCT
ACCGGCATCGCCAAGGTGCTGTTCCTGACGGCAAGATCGTGGCCAAGGTGCCAGGCCAGGTGCAGTGGGACTCGCTGGGGTGAACC
CCTGCCCCCCATCCTGACCGAGATCGTGGCCAAGGTGCCAGGGCGAGGTGGACTGCTCGAGCAGGGGTGAACC
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCTGTGGCGCGCCGCTACACCACTCGAGCTGGTGTCC
CAGGAGAGACCGGCCTACTTCAGCTCGAGATCCTGAAGGTGGCGCCCGGCCATCTGCGGCGGGCGAGCCCGTGAAGGC
CGCCTGCTGGTGGGCGCGCATCGGCCAGGAGTTCGGCCAGACCGCGCCACCTGACAACAAGAGCTGAAGAAGATCA
TCGGCCAGGTGCGCGGACCAGGCCAGCACCTGCTGTTCATCCACAAGCTTCAAGGCGCCATCGGCGCCGCTACTCC
GCCGGCCAGAGATCGACGATCATCGCCACCGACATCGGCCCCCCCAAGGAGGCTGCAGGACAACTTCCGGTGTACTACCGCGA
CTCCCCGACCCCATCTGGAAGGCCCCAAGTCTGCTGTGGAAGGGCGAGGGCCCCGTGGTGCTGGGGATCAAGGTGGTGCCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGAATGCCGGCGACGCTGCTGCGGCGCCGAGCAGAGGACTAA
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Fig. 108A

62 2003 M GROUP anc pol.PEP

FFRENLAFQQGEAREFSSEQTRANSPTSRELRVRGGDNPLSEAGAERQGTVSFSFPQITLWQRPLVTIKIGGQLREALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIATESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 109A

63. 2003 CON A1 pol.PEP

FFRENLAFQQGEARKFSSEQTGANSPTSRDLMDGGRDSLPSEAGAERQGTGPTESFPQITLWQRPLVTVRIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVKQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEIIYQYMDDLYVGSDLEIGQHRTKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIELPEKESWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAELELAE
NREILKDPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYARKRSAHTNDVKQLAEVVQKVMESIVIWGKTPKFKLPIQKET
WETWWMDYWQATWIPEWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIGKDKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRA
MASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVV
HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKAKIIRDYGKQMAGDDCVAGRQDED$
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 108B

2003_M.GROUP anc pol.OPT

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TTCTTCCGGAGGAACCTGGCCTTCCAGCAGGGCGAGGCCCCGGAGTTCTCCTCCGAGCAGCAGCCCGGCGCCAACTCCCCCCACCTCCCGCGAGCTGCGCGTGCCG
CGGCGGCGACAACCCCCGTCCGGAGGCCGGCGGCCGAGGCCCAGGCACCTGGTGCCCAGCGCCCCTGGTGACCA
TCAAGATCGGCGGCATCGGCGCGCAGCTGCGCGAGGCCCCTGCTGGACACCGGCCCGAGCGCCGAGATCAACCTGCCCGGCCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGCTTCATCAAGTGCGCCAGTACGACCAGATCTGATCGAGATCTGCGCGAAGAGGCCATCGAGAAGGCCGTGCCCGTGGTGGCCCCAC
CCCCGTGAACATCATCGGCGCCAACATGCTGACCCAGATTGGCTGCACCCTGAACTTCCCCATCGAGACCGTGCCCGTGCCCGTGAAGCTGAAGCCCG
GCATGGACACGGCCCCCAAGTGAAGCAGTGGCCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCAGAACCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCAGAGACTTCTGGGAGGTGCAGCTGGCATCCCCGCGCCTTCACCATCCCCCTCACCGACCAGAAGATCCTACCAGTACGTGATCGTACCAGTA
TCTCCGTGCCCTGGACGAGGACTTCCGCAAGTACTTCCGCCTCGCCCTCGCCAGTCGCTCCTCCATGATCGGCCAGAACCCCAGATCGTGCGCGTGCGCGTACCGTG
CCCCAGGGCTGGAAGGGCTCCCCCGGCTCCCCGAGAGCTGGTGCCCCTGACCGAGAGCTGGGCCAAGCTGTCCAAGCTGCTCGCG
CATGGACGACCTGTACGTGGGCTCCGAGATCGGCCCCGATGGGCTACGAGCTGAACTGGGCCTCGTCCGGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGATCGCCGCCACCACCAGATCTACCAGGAGGCCCCTTCAAGAACCTGAAGACC
GGCAAGTACGGGCAGATGCCCAAGACCTGGCTCCGCCCCACCACCAGCGTGAAGCAGTGAAGCCGTGATCCATCGTGGGCAA
GACCCCCAAGTTCCGCCTGCCCATCCCAGAAGGAGACCTGGCACTGGCGCCACCTGGACCGGAGTTCGTGAACA
CCCCCCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGGGCGCCGACCGGCGCCATCCCACCTGCCCT
GGCAAGGCCGGCTACGTGCGGGCTCCGGCTGAACATCGTGACCGCGGGCGAGCTGGCCCCGAGTCCGAGCTGGTGAACC
GCAGGACTCCGGCTCCGCCGAGGTGAACATCGTGACCGCGCGACTGGCCCGCCCGCGCAGCAGTCCGACAAGCTGGTGTCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTCCCGCCCCGCAGGGCCATCGGCGCCAACCTGGGCACTTCAA
TCCGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCTCTCCGACTTCAA
CCTGCCCCGTGGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCAGCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGTGATCGAGGTGATCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCAGGTGATCCACACGCAAGTTCACCTCCACCGCCGTGAACC
CGCCTGCTGTGGGCGTGGCGCCAGCGCCATCGCGAGGAGTTCGGCATCCCCTACGTGCCCGCCAAGCCGAGTGGTGTCC
TCCGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCTCTCCGACTTCAA
CCTGCCCCGTGGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCAGCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGTGATCGAGGTGATCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCAGGTGATCCACACGCAAGTTCACCTCCACCGCCGTGAACC
CGCCTGCTGTGGGCGTGGCGCCAGCGCCATCGCGAGGAGTTCGGCATCCCCTACGTGCCCGCCAAGCCGAGTGGTGTCC
TCGGCGAGCTGCGCCAGGCGCCGAGCACCTGGACGCCTGAAGCCGCCGCAGATGGCCGCGCAGATCCAGAAGCTGAAGAAGATCA
GCCGGCGAGCGCATCATCGACACCATCCCCACCGACACCGGCGGCCCCATCGAAGAGCTGCATCGGCGGCTACTCC
CTCCCGCGAGCCCGATCTGAAGGCGCCAGCTGCCAAGGCCCGGGAAGAGGGCGAGGGCGACGACTGCCGTGTACTACCGGA
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGCCGGCCGTGGTGCCCCGCC
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Fig. 109B

2003_CON_A1 pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGAGGCCCGCCAAGTTCTCCTCCGAGCAGCAGACCGGCGCGCCAGCTCCCCGACCTCCCGGACGG
CGGCCGCGACTCCCGCCCTCCGAGGCCGGCCGCCGAGCGCCGAGGCCCTGCTGGACACACCGGCCGCCGCCAAGATCCTGAGATCTGCGGCAAGTGCTGGTGGCCC
CCGTGCGCGCATCGGCGGCCATGCGGCGGCTTGATCAAGGTGAAGCTGAGCGCCAACATGCTGACCCAGATCGGCTGCACCCTGCCCGTGCCCGTGAAGCTGAAGC
ATGATCGGCGGCCATCGTGCCCCCGTGAACATCATCGCGCCCCAAGGTGAAGCTGAGCGCCCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCAAGGAGGGCAAGATC
CACCCCCGTGAACATCATCGCCGGCATGGCCGCCCAAGGTGAAGCAGCAGTGGCCCCCCTGACCCCGGAGGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAAGAGGGCAAGATC
CCGGCATGGACGGCGCCCCAAGGTGAAGCAGCAGTGGCCCCCTGACCCCGGAGGAGAGATCAAGGCCCTGACCGAGATGGAAGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCAAGGAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGGCCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCACCCCCGCCTGGAGAAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGACGAGTCTTCCGCAAGTACACACGCGCCTTCACCATCCCCTCACCAGAGATCCTGGAGCCCTTCCGCTCAAGATCCTGGAGCCCTTCCGCTCAAGATCCTGGAGCCCTTCCGCTCCAGTACATCACCAGTACACAACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCTCCAGTACCTGGAGGACGAGTCCTGTCCTGGGCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATGGGCTACGAGCTGCACCCCGACCTGACCTGCTGTCCGAGAAG
CCCCCCGACAAGAAGCACCAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACATCAGCCGTGCAAGCTGTGTCAAGCTGCT
GAGTCCTGGACCGTGAACGATCATCGAAGCCCTGACCGGAGAGCTGAACTGGGCCTCCAGAAGCTGAAGCAGCTGTGTCAAGCTGTGCACGGCG
GCGCGGCCAAGGCCCTGACCGAGGTCCGAGCTGGAGCTGGGCCGCCTCAACCCGTGCACGGCG
TGTACTACGACCCCTCCAAGGACCTGGTCGCCGGGAAGCCCTCCAGATCTACCAGGAGAATCTACCAGGGACCTTCAAGAACCTGAAG
ACCGGCAAGTACGCCCCCGACAAGGCTGCCCATCCAGGTGGTGTGCAGAAGGTGGTGATGAGGGCCTCCTGATCGTGATCTGGGG
CAAGACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGACCTGGGAGAGGAGAAGGCCGCCCGAGTGGGAGTTCGTGA
ACACCCCCCCCTGGGCAAGGCCTACGTGGCCGGCCCATCGTGACCGACCGCCCATCGTGACCGACCGGCAACCGCGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGTCCGACCGGCCATCGTGACCGACTACGCCCCTGGGTGTCCCTGACCGACCGTGGTGA
TCCTCCAGCTGACCAAGGTGTGTTCCTGAGGGCCCAGGGCATCGTGACCGACAAGTGGCGCCTCCGACTT
CAACCTGCCCGTGAAGGACTCCAAGTGGTGCTGGCCCAAGGGCCATCGTGACCGAGAGCCAGGGCGGAGGCTGGTG
TCCTCCAGCTGACTGCCCACCGACGCCTCTGGAGGGCAAGGTGATCGAGGGCCAAGTGCCCGTGGAGAGACC
GGCCAGGAGAGACCCGTACTTCCTGCTGTAAGGCGCCTTCATCGCCGCCTGGAGGTCCAGGTTCCGAGGTGGAGCTGGGCCATCGGCGGCTAC
GGCCGCCTGCTGGTGGCCGTGCAGGAGGTTCGGCGCCAACATCCAGCAGAGTCCCATGAACAAGGAGCTGAAGAAGA
TCATCGGCCAGGTGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGGAAGGGCGGCATCGGCGGCTAC
TCCGCCGGCGAGCGCATCATCGACGCCATCGCCCGCCCCATCCTGAGGGCCCCGTGGTGAAGGCCGCCGAGAACTTCCGCGACTACACCG
CGACTCCCGCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGACAGATGGCCGCGAGGGCCGCGAGGACGAGGACTAA
GCCCGCAAGGCCCAGAGATCATCCGCGACTACGGGCCGGCGAGCTGCGCGGCCGGCCGTGCCCC
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Fig. 109C

64. 2003_A1.anc pol.PEP
FFRENLAFQQGEARKFSSEQTRANSPTSRELWDGGRDSLLSEAGAERQGTVPSFSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAELELAE
NREILKDPVHGVYYDPSKDLVAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKKRSAHTNDVKQLTEVVQKVATESIVIWGKTPKFRLPIQKET
WETWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVV
HTDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 109D

2003_A1.anc pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCCAAGTTCTCCTCCGAGCAGACCCGCGGCCAACTCCCCGCCACCTCCCGCGAGCTGTGGGACGG
CGGCCGCGGACTCCCTGCTCGTCCGAGGGCGGCGGCCGAGCGCCGAGGCCCTGCTGGACACCGTGCTGCCGGACATCGTGGAAGCCCAAG
CCGTGAAGATCGGCGGCGGCCAGCTGAAGGAGGCCCTGCTGCTGGACACCGTGCTGCCGGACATCGTGGAAGCCCAAG
ATGATCGGCGGCCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGCTGCCGGACCGTGCTGCCGTGCTGGGCCCC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCGAGATCGGCTGCACCCTGAACTTCCCCATCTCCCGAGATCTGCCCGAGATCTGCCGTCCCGTGAAGCTGAAGC
CCGGCATGACGGCCCCAAGGTGAAGCAGTGCGCCCCCGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGGAGAAGGAGGCCAAGATC
TCCAAGATCGGCGGCCCCGAGAACCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCCATCCCCACCCCTTCACCAAGTACAACAACGTG
ACTTTCCGTGCCCCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCTCCAAGAACCCCGAGATCGTGATCTACCA
CTGCCCCAGGCGGCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCTCCAAGAACCCCGAGATCGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCGCCAAGATCGAGGAGCTGCGCGGCCACCTGCTGTCCTGGGGCTTCACCA
CCCCCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCAAGCTGCACCCGGACCTGAAGCCCCGAGATCTACGGCCGAGATCTCCCCGAGATCTCCCGAGAAG
GACTCCTGCAGGCCCTGACCGAGGCTGTGGTGGGCAAGGTGAACCGGCATGGGCTGGACCTGGAGCTGGTGCAAGCTGCT
GCGCGGCGCCAAGGCCCTGACCGACGTGATCCCGAGATCCGGCCGAGAACCCGCGAGATCTACCAGGAGCCCTTCAAGAACCTGAAG
TGTACTACGACCCCTCCTGGTGACCCGCTACGTGGCCGAGATCCAGGAAGTGGTGCAGGAGGTTGGCCACCTGGACTCCGAGTTCGTGTGA
ACCGGCAAGTACGCCGGCTACCGACCTCCGCCAACGGACGCTGAAGCCCCAGAAGATCTGGGGG
CAAGAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGGTGGGAGTTCGTGA
ACACCCCCCCCGTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGCCGGCATCATCCGCGGCCAGTCCGAGCTGGTGA
CTGGGCAAGGCCGGCTACGTGACCGTGATCGAGAAGGAGAAGTGTACCTGTCCTGGTGTCCTGACGAGGGCCGAGCGACCCAGCTGGTG
CCTGCAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCGGAGAAGTGTACCTGTCCTGGTGTCCTGACGAGGGCCGAGCGACCCAGCTGGTGA
ACCAGAGATCATCGAGGAGAGCTGATCGAGAAGGAGAAGTGTACCTGTCCTGGTGTCCTGACGAGGGCCGAGCAAGCTGGTG
TCCTTCCGGCATCGGCGGCAAGGTGCTGTTCCTGGACGGCATCGAGGGGCCGGCCTCCGGCGACTGCTCTCCCCCGGCA
CAACCTGGCCAGCTGGAACCTGCTGCGCTGCTCGGCTGAAGCTGGCCGTGGGCCGGGCCATGCACGCCGAGGTGATCCCGCCGAGACC
GGCCAGGAGACGGCTACTTCCTGCTGGGCCTGGAAGGGCGGAGAGTTCGGCAGGCCCTCCAGCTGGCCAGCTCCAAGCTTCACCTCCCGCCGTGAA
GGCGCCCTGCTGTGGGTGGGCAAGGTGCTGTTCCTGGAGGGCCAACATCATCCAGGAGGCACCTGGAAGGAGGCCATCGAGGCCGAGGTGATCCGGCTAC
TCATCGGCGAGCTGCAGGTGCGCGAGCATCATCGACATCATCCTGGAGGGCCCCGTGTTCATCCGCAAGAAGCAGATCCAAGATCTCCAGGACAACAAGGAGCTGAAGAGA
TCCGCCGGCGAGCAGCTCATCGGCGCCCCCGAGTTCGGCGAGAGTTGGTGAGTCATCAAGCCCGTTGTGTCATCGGCGGCTACCG
CGACTCCCGCGACCCGCCCATCTGTGGGGGGCGGCGGGGCCGTGTTGATCGATCCCCAAGCTCCGACACTCCGGCATCAAGGTGTGGTGCCCC
GCCGCCAAGGCCAAGATCATCCGCGGCAAGGCCAGCGACTACGGCGGCCAAGCTGCGGTGGCCCGGCGACGACGAGGGCGACTAA

Fig. 110A

65. 2003_CON_A2 pol.PEP
FFRENLAFQQREARKFSSEQNRANSPTSRELRNGGRDNLLSEAGAEEQGTVHSCNFPQITLWQRPLVTVKIEGQLREALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQIAIEICGKRAIGTVLVGPTPVNIIGRNMLVQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICKEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLH
EDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRSKNPEMVIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTDIVTLTKEAELELEE
NREILKNPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKRKSTHTNDVKQLTEAVQKIAIESIVIWGKTPKFRLPIQKET
WETWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIAGAETFYVDGAANRETKLGKAGYVTDRGRQKIVSLTETTNQKTELHAIYLALQDS
GLEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRA
MAHDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGPNFTSATVKAACWWAGVQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 111A

66. 2003_CON_B pol.PEP
FFREDLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEM
NLPGRWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVIPLTEEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTI
HTDNGSNFTSTTVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED$

Fig. 110B

2003_CON_A2 pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGCGGCGGGAGGCCCGCAAGTTCTCCTCCGAGCAGCAGAACCGGCCAACTCCCCGCACCTCCCGCGAGCTGCGCAACGG
CGGCCGCGACAAACCTGCTGTCCGAGGCGCCGGAGGAGCCAGGGCAGGGCACCGTGGCACTTCCCCCAGATCAACTTCCCGTGTGCGCAGCGCCCCCTGGTGA
CCGTGAAGATCGGAGGGCCAGCTGCGCGAGGGCCCTGCTGCTGGACACCGGCGCCAGACCGTCTGCTGGAGACATCAACGCCGGCACATCAACGGCAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTAGCACCAGATCGCCATCGAGATCTGCGGGACAGTCTCCCCATCTCCCGTGCCCGTGAAGCTGAAGC
CACCCCCGTGAACATCATCGGCACAACATGTGGCAGCTGGGCTGCAGCCCCTGGCCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCAAGGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCGGCCTGGGCAAAGAAGAAGTCCGTGACGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGCAGGACTTCCGCGACTACTTCTCCACCATCCCGCTCCTCCATGACCAAGATCCTGGAGCACCCGGCTGGGCCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCGCCAAGATCGAGGAGCTGCGCGCCCACCTGCTGTCGGGCTTCACCA
CCCCCGACAAGAAGCACCAGAGAAGCACCAGAGAGCCCCCTTCCTGGTGGGCAAGCTGAACTGGGCCTCCAGCTGAAGCAGGTGAAGCAGCTGTGCAAGCTGCT
GACTCCTGGACACCCCTCCAAGGACACCATCCTGACCGAGGCCAATCGTGGAGCTGGACGCCAGCAGTCACGCGAGACCGCGAGATCCTGAAGAACCCGTGCACGCGCG
TGTACTACGGACACCCCTTCCAAGGAACCTGATCGCCGAGATCTACCAGGATCGCCGAGAAGATCGCGCCACCTGGATCGTGTGATCTGGGG
ACCGGGCAAGTACGCCGAGGCCCAAGCGCCACCTGACCAAGATCTGTGGAGGAGAGCCAGTGAAGCAGTCGAACCCCGAGTTCGTGA
CAAGACCCCCAGTTCCGCCTGCCATCCAGAAGGAGACCCTGGAGATCGCCGGCGCCGCCCATCTACGTGGACGGCCGCCAACCGCGAGACCAAG
ACACCCCCCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCCGGCCGGCCAGATCGTGTCCCTGACCGCCCTGGGCATCATCCCGAGCTGGTGA
CTGGGCAAGGCCGGCTACGTGACCGACCGGCCCCAGAAGATCGTGAGCCTCCCAGTACCCGCCTCCGGGTCCGCCCCCGCCATCGAGCGGCATCGGCGACCTGGTGA
ACCAGATCATCGAGAAGCTGATCGGAAGGAGCGCGGCGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCTCCGGCATCCGCAAGGTGCTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCAGCGACTT
CAACCTGCCCCCATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCCATGCACGAGACTGCTCCCCCGCCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACC
GGCCAGGAGACCGCCTACTTCCTGCTGAAGCTGGCCGGCCGGTGGCCGGTCCCCAGGAGGTGCATCCCCCTACAACCCCCAGCTGCGGGGCGCAGCGGCTGTCTGTG
TCATCGGCCCAGTGCGCGCCAGCGCCGAGCAGCCGCGAGGAGGGCCTGCTGTGGAGGGCCAGCTGGTGGACATCGTGGCCGACTGCGGCAAGACGACCAGGCCTTCAAGGGCGAGGCCTAC
TCCGCCGGCTGGTGGGCTGGGCTGCGCCAGCCACCATCATCCGACCATCTGGAAGGGGCGCAGATCCTGGTGGTGATCCCGACCAAGTTCCGCGATCACTACCG
CGACTCCGCAAGGCCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCAGCCGGGACCTGCGAGGACGACGAGGACTAA
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Fig. 111B

2003_CON_B pol.OPT

TTCTTCCGGCGGAGGACCTGGCCTTCCCCAGGCAAGGCCCGCGCCGAGTTCTCCTCCGAGCAGCAGACCCGCCACCCGCCCGCGAGCTGCAGGTGTG
GGGCCGCGCCGACAACAACTCCCTGTCCGAGGCCACCGTGCTCCTTCCTTCCCCAGATCCACCCGTTGTGGCAGCGGCCGCTGCCCGCGCCCCTGGTGA
CCATCAAGATCGGCGGCATCGGCGGCCTTCATCAAGGTGCCGCCAGTGGCCCTGCTGGAGGAGATGAAACCGCCGTGGAACCTGGCCCGCTGGAAGCCCAAG
ATGATCGGCGGCATCATCGGCCGCAACATGCTGCTGACCCAGATCGGCCTGCAGATCCTGATCGAGAATCTGCGGCCAAGATCTGCCCCATCTCCCCATCTCCCCAGAACTTCCCGTGCCCGTGAAGCTGAAGC
CACCCCCGTGAACATCATCGGCCGCCAACCTGCTGACCCCTGCACCTGGGAGATCGCGGGAGAGATCAAGGCCCTGGTGGAGATCTGCACCGAGATGGAGGAGAGGGCAAGATC
CCGGCATGGACGCGGCCCAAGGTGAAGCAGTGGCCCCCTGACCACCCCCGTGTTCGCCATCAAGAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
TCCAAGATCGGCCACCCGAGAACCCTACAACACCCCGTGTTCGCCATCCCCCTCACCCGAGCATGGGCCATCGCGGGGTGCAGCCCCGGCATCCCCCTCACCCGAGCATCGCGGAGGTGCAGCGGCGACGCGCCT
CAAGGCGCACCCAGGACTTCTGGGAGGTGCAGCGGCTCCCCCGGCACTGGGCCATCCCCCGGTGCGCAGGGTGCAGCGGCATCCCCGGCAGAAGAAGAAGTCCGTGGGGCGACGTG
ACTTTCTCCGTGCCCCTGGAAGGGCTCCCCCGACCAGTCTCCTCATGACCAGACCGACCGCCCTTCGCGCTGCGGCTTCACCA
CTGCCCCAGGGCTGGAAGGGCTCCCCCGACCAGTGCTCCGGGCGAGATCGGCCAAGATCGAGGAGCTGGCAGCTGCTGCCCGAGAAG
GTACATGACGACCTGTACGTGGGCTCCGACATCCAGAATCTTCCAGTCCTCCAGTGGGCTTCTGGTGGGCAAGCTGTGTGCAAGCTGCT
CCCCCCGAACAAGAGCACCAGAGAAGGAGCCCCCTTCGTGGATGGGCTGACCGAGCTGACCCCCGATCCGCCAGGTGCTGGAGCTGCAAGCCCGTGCAGCGGCG
GCGCGGCCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGGGCCCAGGGCCCAGATCCAGAGGGCCAGGGCCCTTCAAGAACCTGAAG
TGTACTACGACCCCTCCAAGAGACGATCCGCCGAGATCGCCCAGATCTACCGGCGCAGTGGACCTCTTCAAGGAGCGCCAGAGTCCATCGTGATCTGGGG
ACCGGCAAGTACGACGGCCCACCACCAGCGGCCCCCATCGAGAGCCAAGAAGAGAGATCGGCCACCTGGACCAGCAGTCCCGAGTCCCGAGTTCGTGA
CAAGACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGACACCTGGGAGGCTGGAGCAGCTGGTGGAGGAGCAGGCCCAACCGCGAGACCCAAG
ACACCCCCCCGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCATCGTGGGCGCCGAGACGAGCTGCACGTGGACCGCCCATCCCCTGGC
CTGGGCAAGGCCGGCTACGTGCCTGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCGAGGTCCGAGCTGGTGT
CCTGCAGGAGCTCCGGCCTGGAGGTGAACATCGTGATCAAGAGAAGGAGAGGCCCATCGTGGGCCGCCGAGACCCCGCCGAGACC
TCCGCCGGCATCGCGGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGCAGCATCGAGGAGCAGCATCATGGCCTCCGACTT
CAACCTGCCCCCGTGGTGGCCCAAGGACATCGTGGCCTCCTGCGACAAGTGCCAGCTGGAAGGGCCATCGAGGCTGGACTGCTCCCCCGGCA
TCTGGCAGCTGGACTGCACCCCACCTGGAGGGCAAGATCATCCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGTGGTGT
GGCCGCTGCTGTGGTGGGCGCGCCTACTTCCTGCTGAAGCTGGCCGGCAGGCCGTGGTGAGTGGTCATGAACAAGCGCGGCATCGCGGGCTAC
GGCGGCCTGCTCCGTGGGGCCGCGCATCGAGGAGTTCGGCGTGCCTGAAGACCCTGTAACAACCCCTACAACTTCACCTCCCAGCGGTGGTGAAGTGCTGGTG
TCATCGGCCGCATCGCCGACCAGCTGTGGGGCCGCGATCATCCCGAGCGGGTCTGTGTTCATCCAGAACTTCAAGCGCAAGGGCGGCATCGGCGGCTAC
TCCGGCAGGTGCGGCGAGGTGCATCATCGCCGACACCCCGCAGAAGGGCCATCATCGGCCCGACCCCAGCTGTGTGGAAGGGGCTGAGGCGCGAGGGCGCGAGGACTTCCGCGTGTACTACCG
CGACTCCGCGGCGAGATCATCCGCGCCGACTACGTGCCGGCCGCTGCGAGATGGCCAAGGCCAAGATCCCCCGCAGGACAACTCCGACATCAAGGTTGGTGGTGCCCCC
GCCGCAAGGCCCAAGATCATCCGGCACTACGGCCAAGATGGCCGGCGAGCGCGTGCTGCTGGCCGGCGACTGCGGTGGGCCGCGACGAGGACTAA

Fig. 111C

67. 2003_B.anc pol.PEP
FFRENLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNPLSEAGADRQGTVSFSFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEM
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGSNFTSTTVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIiGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED$

Fig. 111D

2003_B.anc pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCAAGGCCGCGAGTTCTCCTCCGAGCAGAGACCCGCGCCACCCCGCCGCGCGAGCTGCAGGTGTG
GGGCCGCCGACAACAACCCCTGTCCGAGGGCACCGTCCTTCCTTCCCCCAGATCACCCTGTGGCCAGGGCACCGCCCCCTGGTGA
CCATCAAGATCGGCGGCCAGCTGAAGGAGGGCCCTGCTGGACACCGGCGCGGCCGACACCGGTGCTGGACGATGAACCTGCCCGGCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCCAGATCCTGATCGAGATCTGCGGCAACTCCCCATCTCCCCATCGAGACCGTGCCCGTGAAGCTGAAGC
CACCCCCGTGAACATCATCGGCGGCCCCCAAGGTGAAGCAGCTGAAGCAGTGGCCCCCAGAGAGATCGGCCGAGGAGAAGATCAAGAGCAGGCCAAGATC
CCGGCATGGACGCGGCCCCAAGGTGAAGCAGCTGAAGCAGTGGCCCCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAGAAAGACTGGCGGCAAGTGGTGACTTCCGCGAGCTGAA
TCCAAGATCGGCCACCCAGGACTTCTGGGAGGTGCAGCTGGCCATCCCCCACCCCCGGCATCCCCCGCCTTCACCAGTACAACACGAGACCCCGGCTACCAGTACAACGTG
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGCCATCCCCCACCCCGGCATCCCCCGCCTTCACCAGTACAACCGGCTACCAGTACAACGTG
ACTTCCGTGCCCCTGGACAAGGACTTCCGCAAGTACACCGCCTTCACCATCCCCTTCACACATCCCCCAAGATCCAGCAGCTCCGGCTCACGTG
CTGCCCCAGGGCTGGAAGGGCTCCCCCCGCCCATCTTCCGACCTGGGCTCCGACGCTGGAGATCGGCCAGCTGAGCACCGCGCGAGCTGCGGGCTTCACCA
GTACATGGACGACCTGTACGTGGGCTTCCGACCTGTGGGATGGGCTACGAGCTGAACTGGGCCTGCAAGCTGAAGCAGCTGTGTCAAGCTGCT
CCCCGACAAGAAGCACCCAGAAGGAGGGCCCCTTCCTGTGGGGCAAGCTGAACTGGGCCTGCAAGCTGAAGCAGCAGCTGTCAAGCTGCT
GACTTCCTGACCCGTGAACGAGCCCTGACCGAGTTGGTGCCCCTGACCGAGGAGGGCCGAGCTGGCCGAGAGCGGCCAGTGGCCAGCTGAGCAGGACGTGCGCAGGCG
GCGCGGCAAGGCCTACGTGACCCTCCAAGGACCTGATCGCCGCGCCCACAACGACCTGGGCCCGAGATCCTACCAGGAGCCCTTCAAGAGAACCTGAAG
ACCGGCAAGTACGCCCCGCCAAGGCCTACGTGACCCTGGAGCCGGTCGAGAGATCGGCCACCTGGATCCCCGAGTGGGGAGTTCGTGA
CAAGAGACCCCCAAGTTCAAGCTGCCCATCCAGAAGGAGACCTGGGAGGCCTGGTGGTACTGGCACCTGGATCCCCGAGTGGGAGTTCGTGA
ACACCCCCCCCCGTGGTGAAGCTGTGTGTACCAGCTGGAGAAGGAGCCCATCGTGGGCGCCGAGGACCTTCTACGTGGACGACACCAGAAGACCGAGTGGGCGCCAACCGCGAGACCAAG
CTGGGCAAGGCCTACGCGGCTACGTGACCGACCGGCGCGGCCAGAAGGTGGTGTCCCTGACCGAGTTGTCCCTGACCGAGAAGGTGGTGTCCCTGAGCTGCGAGCTGCGAGCTGCCATCCACCTGGC
CCTGCAGGACTCCCGGCCTGAAGCTGCGTGTTCCTGGACGGCATCGAAGCTGGCATCGAACGACCCTGGGCATCATCCAGGCACCCCCAGAGTCCGAGCTGGTGT
CCCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCTGGGTGCCCGCCCACAAAGGGCATCGGCGCGGCAGAGAGTACCACTCCAACTGGCCGCGCATGCACCTGGACAAGCTGGTG
TCGCCCGGCATCCCCCCGTGGTGGCCCAAGGAGATCGTGGCCCTCCTGCCGCGCGGCATCAAGAGAGTTCGGCAGAAGTGCCCAGGTGGACTGGACTGCTCCCCCGGCA
CAACCTGCCCCCCGTGGTGGCCCAAGGAGATCGTGGCCCTCCTGCCGCCGCGGCCGCCAGGGCCTGAAGGGGCCAGGTGGACTGGACTGCTCCCCCGGCA
TCTGGCCAGCTGACTGCACCCCACCCTGGAGGGGCAAGATCATCCTGGTGGCCCGTGCTGGTGACGGTCGAGGCCGAGGTGACCGGACC
GGCCAGGAGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCAGGGAGTTCGGCCAAGGACCCGAGAGTGGTGGTGTCCATGAAGCTGGCCATCAGGAAGCTCGCGGCTACGTGAAGAAGA
GGCCGCCTGCTGGTGGCGCGGCATCGTGGACATCATCGCCGACAACGTGGTGGTGTGTTCATCGAACGACAAGGGCCGCCAACTTCCGGCTGTACTACG
TCGCCCGGCGAGCTGGTGGCCGGCCATCATCGCCGACAACGTGGTGGTGTGTTCATCGAACGACAAGGGCCGCCAACTCCGACATCCGACATCCAAGCTGTACTACG
CGACTCCCGCGACCCCCCTGTGTGGAAGGGCCGACGTGCTGCTGGAGAAGGGCGAGGGCGAGGGCGCGACTCCCGCCAAGCTCCGAGGACCGAGGACTAA
GCCGCCAAGGCCAAGATCATCCGCGACTACGCCAAGCAGAAGATGGCCGGCCAAGAGCTGCGTGGCCGTGGAAGGGCCGCGACTGCCGCGGCGAGGACTAA

Fig. 112A

68. 2003_CON_C pol.PEP

FFRENLAFPQGEAREFPSEQTRANSPTSRELQVRGDNPRSEAGAERQGTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEINLPG
KWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKA
LTAICEEMEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEGFR
KYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFTTP
DKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENREI
LKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKTPKFRLPIQKETWETW
WTDYWQATWIPEWEFVNTPPLVKLIWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTDRGRQKIVSLTETTNQKTELQAIQLALQDSGSEV
NIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASE
FNLPPIVAKEIVASCDKCQLKGEAIHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYYILKLAGRWPVKVIHTDN
GSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQ
TKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDED$

Fig. 112B

2003_CON_C pol.OPT
TTCTTCCCGGAGAACCTGGCCTTCCCCCAGGGCGAGGCCCGCGAGTTCCCCTCGAGCAGCAGACCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCAGGTGCCG
CGGCGACAACCCCCGCTCCGAGGCCGGCGCCGAGCGCGCCAGGGCAGGCGCGGCCGCGAGCGCGCCCCCAGATCACCCCTGTGGCGCGCCCCCCTGTGTCCATCAAGGTGG
GCGGCCAGATCAAGGAGGGCCCTGCTGGACACGGCGGCCGACACCGTGCTGGACGATCCTGATCGAGATCCTGAGACTTGCGGCAAGTGGAAGCCAAGATGATCGGCGGC
ATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGTACCTGATCGAGATCTGCGGCCAGATCTCCCCATCTCCCCATCCTGAACTTCCCCCATCTCCCCTGAACTTCCCCCATCTGAGACTTGGCGCAAGTGCCGTGCCCGTGAAGCTGAAGCCCGGCATGACG
CATCATCGGCGCCAACATGCTGACCCAGCTGGGCTACGACGACCCCAGCTGCTGACCGAGGAGAGAATCAAGGCCCTGACCGAGGAGATGAGGCAAGATCACCAAGATCGGC
GCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAGAATCAAGGCCGCATCTGCGAGGAGATGAGGCAAGATCACCAAGATCGGC
CCCGAGAACCCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAAGCGCACCCA
GGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCGCCTTCACCAACCCCCTCCCATCCTGGAGCTGGAGAAGGAAGCGCACCCAGTACAACGTGCTGCCCCAGGGC
CCCTGGACGAGGGCTTCCCGCCATCTTCCAGTACACCCGGCCTTCCATGAGCCGCCCAGATCCTGGAGAACCCCGAGATCGTGATCTACCAGTACATGGACGA
CCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCACCAAGATCGAGGAGCTGCGGCAAGCTGCTGAGAGTGGGGCTTCACCACCCCGACAAGA
AGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGGCCCATCCAGCTGCCCGAGAAGGACTCCTGGACC
GTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTGCGCCAGCTGTGCAAGCTGCTGCGCGGCCAA
GGCCCTGACCGACGACATCGTGCCCCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCTGAAGAACCTGCACCGGCGTGCTACTACGACC
CCTCCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCCAGCAGTGAAGCTGACCTACCAGATCTACCAGATCATCGTGTGAAGACCGGCAAGTAC
GCCAAGATGCGCACCGCCCATCCAGAAGGAGAACGCGTGGGCAGCTGTGGTGACCGAGTCCCGAGTCCCCGATCGCGGAGTTCGTGAACACCCCCCCCCAA
GTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGTGGACCGAGTCCCCGAGTCCCCGAGTTCGTGAACACCCCCCCCCAA
TGGTGAAGCTGTGGTACCAGCTGGAGAAGGAGCCCCATCGCGGGCCCGAGACCTTCTACGTGGACGGCGCCGCAACCGGAGACCAAGATCGGCAAGGCC
GGCTACGTGACCGACCGCGGCCGCCAGAAGATCGTGTCCCTGACCGACACCACCAACCCAGAAGAACCCGAGCTGCAGCCCATCCAGCTGCCCCTGCAGGACTC
CGGCTCCGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACCAGAGCGAGAGTGCGGCTGGTGAACCAGATCATCG
AGCAGCTGATCAAGAAGGAGAAGGTGTATCTGGCCTGGGTGCCCCGCCCACCAAGGGCATCGGAGGCAACGAGCAGGTTGACAAGCTGGTGTCTCCGGCATC
CGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGACGAGCACGAAGAAGTACCCAGCTGAAGGGCGAGGCCCAGGTTCAACCTGCCCCC
CATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCAGCCCGGCATC
ACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCGGCCGAGACCGGCCAGGAGACC
GCCTACTACATCCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCAGCCGCCCTGCTG
GTGGGCCGGCCGCATCCAGCGAGGAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCATCGGCCAGG
TGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTCCGCGGCGAG
CGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCGCGACTCCCGCGA
CCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGCCCCGCCGCAAGGCCA
AGATCATCAAGGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGGCCGCCAGGACGAGGACTAA

Fig. 112C

69. 2003_C.anc_pol.PEP
FERENLAFPQGEAREFPSEQTRANSPTSRELQVGRDNPRSEAGAERQGTLTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEINL
PGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKI
KALTAICEEMEKEGKITKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEG
FRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFT
TPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENR
EILKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKTPKFRLPIQKETWE
TWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTDRGRQKIVSLTETTNQKTELQAIQLALQDSGS
EVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMA
SEFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHT
DNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATD
IQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGADCVAGRQDEDS

Fig. 112D

2003_C.anc pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCGGAGGCCCGCGGGAGTTCCCTCCGAGCAGAACCCGCGGCCAACTCCCCGCACCTCCCGCGAGCTGCAGGTGGG
CCGCGACAACCCCGCTCCGAGGCGGCCGAGCGCGCCAGGGCGCCCAGGGCACCCGGACACCGCCCTGCTGACCACCGTGCCGGCGACGATCCTGGCGCCCCTGGTGTCCATCA
AGGTGGGCGGCCAGATCAAGGAGGAGGCCCTGCTGACCGGCGCCCAGGGCCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCCAGATCCTGCTGGAGGAGATCAACCGTGCCGGCGACACCGTGCCCGGCAAGAGGCCATCGAGATGATC
GGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCCAGATCCTGCTGGAGGAGATCAACCGTGCCGGCGACACCGTGCCCGGCAAGAGG
```

Fig. 113A

70. 2003_CON_D_pol.PEP

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EFRENLAFPQGKAGELSSEQTRANSPTSRELRVWGGDNPLSETGAERQGTVSFNFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIKLPEKESWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGTKALTEVIPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIAIESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIIGAETFYVDGAANRETKLGKAGYVTDRGRQKVVPLTDTTNQKTELQAINLALQDSG
LEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVVH
TDNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIRDYGKQMAGDDCVASRQDEDS
```

Fig. 114A

71. 2003_CON_F1_pol.PEP

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EFRENLAFQQGEARKFPSEQTRANSPASRELRVQRGDNPLSEAGAERRGTVPSLSFPQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVKQYDHILIEICGHKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRTKNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLKWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEAVQKIALESIVIWGKTPKFKLPILKET
WDTWWTDYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGASNRETKKGKAGYVTDRGRQKVVSLETETNQKAELQAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIQKEKVYLSWVPAHKGIGGNEQVDKLVSAGIRKILFLDGIDKAQEEHEKYHNNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKII
HTDNGSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGRQDEDS
TDIQTRELQKQITKIQNFRVYYRDSRDPVWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDS
```

Fig. 113B

2003_CON_D_pol:OPT

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TTCTTCCGCGAGAACCTGGCCTTCCCCCAGGGCAAGGCCGGCGAGCTGTCCTCCGAGCAGACCCGGCGGAGCTGTTCGCGCGTGTG
GGGCGGCGACAACCCCGTCCGGAGACCGGCGCCGAGGCGCCGAGGGCGCCAGGGCACCGGCCCGAGATCACCCTGTGCAGCCCCCTGGTGACCA
TCAAGATCGGGCGGGCGGCCAGCTGAAGGAGGGGCCCTGCTGGACCACGGCCGGCCGAGACGCCGGTGCTCTGGAGGAGATCCTGATCGAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCGCACCAGATCTGCGGCACCAGGCCATCGGCGCACCGTGCCGTGGCGCCCAC
CCCCGTGAACATCATCGGCGCCCAAGGTGAAGCAGCAGTGGCCCCTGACCGAGGAGAGATCAAGGCCCTGACCGAGATCTGCACCGAGCTGGAAGCTGAAGCCCG
CGCATCGGCCCGAGAACCCCTACAACACCCCCATCTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GGGCACCCCAGAGACTTCTGGGAGGTGCAGCTGGCCATCCCCCACCCCCGGCGTGGGCATCCCGGCGCTGACCGGTGGGCGACGCCTACT
TCTCCGTGCCCCTGACGAGGAGATCCCCGGGCTCCCCCGCCATCTTCCAGTCCTCATGACCAAGATCCTGGAGATCGGCAAGCAGAACCCCGAAGATCGTGTACCAGTA
CATGGACGACCTGTACGTGGGCTTCTGTGATGGGCTACGGACGTGCACCCGGCGACAAGTGGCTGCACCCCGGCTTCACCACCC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCCCGAGAAGGAG
TCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCCGACCTGGAGCTGCGCAAGCTGCTGCG
CGGCACCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGATCCAGATCGGCCGGCAGGGCCAGCAGCAGGAAGGAGAACCTGAAGACC
ACTACGACGAAGAGCACCAGAAGAGCCCCCTTCCAAGGACCCTGATCGCCGAGGACTGATCGGCGCGCCACACCAAGGAGATCGGCGGCCGTGAAGCTGCCCGAGAAGACC
GGCAAGTACGCCCCGCCATGCGCCCTGCCCATCCAGAAGGAGAACGACTGGTACGACGTGGAAGCAGCCTGGTGGGCAA
GACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGGACCTGGTGGGACCGGAGTACTGGTGGGAGTTCGTGAACA
CCCCCCCGTGGTGAAGCTGTGGTACCAGCTGGAAGAGAAGGAGCCCATCATCGGGCGCCGAGACCTTCTACGTGAACCGGCCAACCCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGACCGGGCGCGCCGAGGTGTGTGCCCCTGACGGCCGAGAAGGTGTCCCAGTACCGCGCCCGCCATCAACCTGCCCT
GCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACCTGGGCCTGGGCGTCCCAGCTGGTGTCCC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACAACGAGCAAGCTGGTGTCC
AACGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGACGAGCACGAGAAGTACCACACAACTGGCGCGCAACAACTGCGCGCCCATGGTCAAGCTTCAA
CCTGCCCTGGTGGTGCCCCGTGGTGCGCAGGCCAAGGTGATCCTGGTGGCCGTCTGGGCCCAGGGCCAGGTGATCCCCGGCGAGACCGGC
GCGAGCTGGACGCCCTACTTCCTGCTGAAGCTGGCCGGCCGCTGGCCCGCTGCCCGCGTGGTGTCCC
CAGGAGACTCGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCGGACGAGCTGGAAGGC
CGCCTGCTGGTGGCCCTCGGCCGCATCAAGCAGCAGCAGGAGTTCGGCCATCCCCTACAACCCCCCCAGGTGGTGCCGTGTTCATCCACAACGGCGGCATCCTGCCTACTCC
TCGGCCCAGGTGCCGCGACCAGGCCGAGCTGCTGCTGTCCCCCGGCCGCACATCAAGCGCAAGACCGGCGGCATCGGCGAAGGC
GCCGGCGAGCCGCCATCATCGACGACATCGCCCCAAGGCCCCCCGCAGCTCCTCGTGTGATCCAGGACAACTTCGGCCGTGTACTACCGCGGA
CTCCCGCCGAGATCCGCGACTACCGCGAAGGGCCTGTCCGTGGATCCAGGACAACTTCGGCCATCATCCAGCCCGCCAAGGTGGTGTGCCCCGCC
GCAAGGTGAAGATCATCCGCGGACTACGGCAAGCAGATGGCCGGCGACTGCGTGGCCTGGCCCCCAGGAGACGAGGACTAA
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Fig. 114B

2003_CON_F1 pol.OPT

Fig. 115A

72. 2003_CON_F2 pol.PEP
FFRENLAFQQGEARKFSSEQTRANSPASRELRVRRGDNSLPEAGAEROQTGSSLDFPQITLWQRPLVTIKVGGQLREALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQIPIEICGQKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KEFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAKNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQAIQLPDKSSWTVNDIQKLVGKLNWASQIYPGIRVKHLCKLLRGAKALTDVVPLTAEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPHKNLKTGKYARRKSAHTNDVKQLTEVVQKIATEGIVIWGKVPKFRLPIQKET
WEIWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVPLTETTNQKTELQAIHLALQDS
GSEVNIVTDSQYALGIIQAHPDKSESELVNQIIEQLIQKERVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEEHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKII
HTDNGSNFTSTVVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYFRDSRDPVWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 116A

73. 2003_CON_G pol.PEP
FFRENLAFQQGEAREFSSEQARANSPTRRELRVRRGDSPLPEAGAEGKGAISLSFPQITLWQRPLVTVKIGGQLIEALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEISGKKAIGTVLVGPTPINIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
NFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKESWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKELIAEVQKQGLDQWTYQIYQEPYKNLKTGKYAKRGSAHTNDVKQLTEVVQKIATESIVIWGKTPKFKLPIRKETW
EVWWTEYWQATWIPEWEFVNTPPLVKLWYRLETEPIPGAETYYVDGKQKIITLTETTNQKAELQAIHLALQDSG
SEVNIVTDSQYALGIIQAQPDRSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIIVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 115B

2003_CON_F2 pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCCAGGCCGGCCAAGTTCTTCCTCCGAGCAGACCCGCGGCCAACTCCCCCGCCTCCCGCGAGCTGCGCGTGCG
CCGCGGGCGACAACTCCCCTGCCCGAGGCCGGCGGCCGAGCGCGCCAGGCCGCCAGGGCCCTGCTGGACACCGGCGCCGACGAGACTTCCCTCCTGGACTTCCCCAGATCACCCTGTGCAGCGCGCCCCTGGTGA
CCATCAAGGTGGGCGGCAGCTGCGCGAGGCCCTTCATCAAGGTGCGCGACTACGAACCAGATCCCCATCGGCGACACCGTGCTGCCCGGCCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGCGGCTTCATCAAGGTGCGCGCAACATGCTGACCCCAGATCTGCGCCAGATCTCCCCATCTCCCCCATCGGCGTGCACCCTGCTGGTGGGCCC
CACCCCCCGTGAACATCATCGGCCGCCAACATGCTGACCCCAGATCTGACCCCAGATCTGCCCCTGAACTTCCCCATCGACACCGTGCTGCCCGTGAAGCTGAAGC
CCGGCATGGACGGCCCCAAGGTGAACGCAGTGGCCCCTGACCGAGGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCAGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGAAGAGGACTCCACCAAGTGGCCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTTCGGCAAGAAGGAGTTCCGCAAGTACACCCCGGCATCCCGCTACCAGTACAACGTG
ACTTCTCCGTGCCCCTGGACAAGGAGTTCCGCCAAGTCCTCCAGTCCCATGACCCAAGATCCTGGAGCCCTTCCGCGCCAAGAACCCCGAGATCGTGATCTACCA
CTGCCCCCAGGGGCTGGAAGGGCTCCCCCGCCATCTTCCAGACCCTGTACGTGGGCTCCGACCTGTATGACGACCTGTACGTGGGCTCCGACCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCACCAACCGAGATCGGCCACCAACAAGATCGAGGAGCTGCGCGAGAAGATCGAGGAGCTTCACCA
CCCCCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGACGTGCACCCCGACAGTGGACCGTGCACCCCGACAAG
TCCTCCTGACCCGTGAACGACATCCAGAAGCTGGTGGGCCAAGCTGAACTGGGCCTCCAACCTGGAGGGCCTGAAGCACCTGTCGCGTGCAAGCTGCT
GCGCGGGCCAAGGCCCTGACCGAGGTGCCCCTGACCGCGCCGAGCTGGCCCTGACCGAGGCCGAGAATCCTGAAGGAGCCCGTGCACGGCG
TGTATCTACGACACCCCTCCAAGGACCTGATCGCCGCCAGAGATCCAGAGAAGCAGGCCCACGACCTACCACCAGATCTACCAGAGAAGAACCTGAAG
ACCGGCAAGTACGCCCCCCGCCGCAAGTCCCCCCACCACCAAGACGTGGTGCAGCAGCTGAAGAATCGTCGTGATCGTGGGG
CAAGGTGCCCAAGTTCCGCCTGCCCATCCCACCACCTGGGAGATCTGGTGCCAGAGATCTGGTGACCGTGGAGTTCGTGA
ACACCCCCCCTGGTGAAGCTGTGTGACCAGCCGGCGGGCCAGAGGCCTGGAGGACCGAGAGACCAACCGCGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGGGCCGCCAGAAGGTGGTGCCCCTGACCGACCCCGGGCATCCGCGCGCATCCGCGAGCTGGC
CCTGCAGGACTGGCCTCGCGAGGTGAACATCGTGACCGACTCCCAGTGAACATCGTGCTGGGTGCCCGCCCCACCCCGACAAGTCCGAGCTGGTGA
ACCAGATCATCGGCCATCGAGCCGCGAGGAGCGCGTGTACCGGCATCGGACCGCCGTGTCCCTGACCGAGACAAGGCCAGCATCGGCGGCAACGAGAGCTGGTG
TCCACCCGGCATCGCCCCCCGTGGCCCCCGGCATCGACCCCGCGCATCGACCTGGCGCCGCCCCCGCGAGCTGCTCCCCGGCA
CAACCTGCCCCCGTGGCTGGTGGCCCCCAAGGAGATCGTGGCCCAAGAGTCGTGGCCGTGGCCGTGGCCCATGGCCCAGGTCACGGCGTGCTCTCCCCGAGACC
TCTGGCAGCTGGACTGCCACCCCACCTGGAGGGCAAGATCATCTCCGGCCCGCTGGCCCTGGCGCCGCTGCTACGTGATCCCCGCCCGAGACC
GGCCAGGAGGAGACCGGCCTACTTCATCCTGAAGCTGGCGCCGCGTGAAGATCTGCGCCGCTCCAACTTCACCTTCACCGTGGTGAA
GGCCGGCTGCGTGGGCGGCCCCATCCGGCCGCATCCGGCCGCAGGAGTTCGGCGGCATCCCCCAGTCCCAGTGCGAGTTCCAGGCCGTGGTGGAGTCCCATGAACAAGGAGCTGAAGAGA
TCATCGGCCAGTGCCGGCGACCGGCCGGCCGCACCTGACCTTCATCCACAGCCGCATCCCAGCCGCGATCCGGCCGTGTTCATCGGCAGATGCCGTGGTGATCAGAAGATCGGCGCTAC
TCCGCCGGCGAGGCGACCCCGTGTGGAAGGGCCCCGCCGACTGCTGTGTGACACCGGCAAGCTGCTGGTGGTGCCCGCCGTGACTTCCG
CGACTCCCGCGAGGGCCAAGATCATCCGCGACTACGGCCAAGCAGCAGATGGCCGCGGCTGCGTGGATCCGGCCCGACGACGAGGAGACTAA
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Fig. 116B

2003_CON_G_pol.OPT

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TTCTTCCGCGAGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGAGTTCTCCTCCGAGCAGGCCCGGCGCGGCCAACTCCCCCACCCGCCGCCGGAGCTGCCGCTGCCG
CCGCGGCGACTCCCCCTGCCCGAGGGCCGGCGCCGAGGGCCAAGGGCCGCGGCCCGAGATCTCCCTGTGGCAGCGCCCCCTGGTGACCG
TGAAGATCGGCGGCGCCAGCTGATCGAGGCCCTGCTGGACACCGGCGCCGAGTACCAGATCCTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTGCGGCCATAAGAGGCCATCGCCGAAGAAGCCGTGCCCGTGGTGGGCCCCAC
CCCCATCAACATCATCGGCCGCAACATGCTGACGCTGCTGGGCCCCACCCCAGAGGCTGCACCCGAGATCTCCCCATCTCCCGAACTTCCCGAGAGATCTCC
GCATGGACGGGCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATCTCC
AAGATCGGCCCAGAGAACCCCTACAACACCCCAGTGGCCCCAATCCCCCACCCCGATCCGCCTGGCATCCCGCCGCAAGTGCGCCAAGCTTCCGCGAGCTGAACCAA
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGCATCCCCAAGTACACACCGCCTTCCACCATCCCCCTCCACCATGACCACCGCCTACCACCGTGCTG
TCTCCCGTGCCCCCTGGAGCAGAGAACTTCCGCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCACCAAGAACCCCGAGATCGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCGCCATCTGGGGCTCCGACCTGGCTCGCAGCACCGGCCAAGATCGGGCCGAGAGCTGCGGCACCTGCTGGGGCTTCCACCACCC
CATGGACGACCTGTACGTGGGCCTCCGACCGAGATCGGCGGCGAGATGGGCTACGAGCTGCACCCCGACAAGTGCACGCTGCAGCCCATCCAGCTGCCCGACAAGGAG
CCGACAAGAAGCACCAGAGGAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGGCCTGAACGGTGAGCAGCTGTGTCAAGCTGCTGCG
TCCTGGACCGTGAACGACATCCCAGAAGCTGTGTGGGCAAGCTGGTGCCCCTGACCGGCGCCGAGCTGGAGCTGGCCGAGATCCTGAAGGAGCCCGTGCACGGCGTGT
CGGCGCCCAAGGCCCTGACCGACGATCGTGCCCCTGACCGCCCCCACACGCCGCTGGGCGAGAAGCAGGGCCTGGAGCAGCTGAAGCAGCTGAAGGAGCTGCTGCG
ACTACGACCGGGTACGCCAAGATCGACCCCCCAAGCGGGCGGGTCCGCCCGGCCCACACGACCAGCAGCTGAAGCAGCTGAAGGAGGCCCTACAAGAACCTGAAGACC
GGCAAGTACGCGGCTACGTGACCGATCGTGGGACAGGCGGCGCGCCAACGACCCCAAGGAGGCCGAGCTGCAGGCCCATCAGTCCCGAGTGGGGAGTTCGGCAGAACTG
GACCCCCAAGGTTCAAGCCCCATCCCCATCCCCCATCCCCGGGCAAGGAGACCGCCCTGGCATCATCGGCCCACCTGGAGAAGGCCCGAGCTGCAGGCCCATCCACCCTGGCCCT
CCCCCCTGGTGAAGCTGTGGTACCGCCTGGAGAAGGAGCCCATCCCCCGGCGCCGAGAGCGCCCCGAGACCACGTGGACGGGCGCCCAACCGCGAGACCAAGCTG
GGCAAGGCCGGCTACGTGACCGTGAAGGGCTCCTGGTACTGGCAGGCCACCTGGGACCAGCCCCATCCCCGGCGCCGAGGAGATCCTGGCCCATCCACCCTGGCCCCT
GCAGGGACTCCGGCTGATCGAGGCTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCCAGGCCAGCCGGACTCCGAGTGCCGAGTCCGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCCCGCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCC
TCCGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCTCCGACTTCAA
CCTGCCCCCCATCGTGTGCCCCTCCTGCGACAAGAAGATCGTGGCCTGGCCAGCTCGCAGCCAGCGAGCTGGACTGCTCTCCCCCGGCATCT
GGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGTGAAGGTGGCCGTGCACACCGACAACGGCTCCAACTTCACCTCCAACTGGCCAAGCCGTGAAGGC
CGCCTGCTGGTGGCCCGGCATCATCGGACATGCTGAAGACCGCCGTGTTCATCCCACACGAGACCCACGGCCATGGCCATGAACGACCTGGGTGGAGTCCATGAACAAGGAGCTGAAGAAGATCA
TCGGCCAGGTGCGCGACCAGGCCGAGCATCATCGGCGGCTACTCCGCAGGAGATGGGCTACGCCCCAGTCCCATGGTGGTGAGTCGGAGAAGAAGGAGCTGAAGAAGATCA
GCCGGCGAGAGCGCATCATCGGCCAGCCCCCATCTCCCAGAAGGGCGGCATCGGGCCGGCATGAACGTGTTCCGGTGTACCGCCGGCTACTCCGGA
CTCCCCGCCCGCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGCGGCGGCCGACGAGGGCGCGTGGGGGCGAGGTGGGCCCCGGAGGACGAGGACTAA
GCAAGGCCCAAGATCATCCGCGAGATGGCCAAGCAGCAGATGGCCGCGGCCGACGAGGGCGCGTGGGGGCGAGGTGGGCCCCGCC
```

Fig. 117A

74. 2003_CON_H pol.PEP

FFRENLAFQQREARKFSPEQARANSPTSRELRVRRGDDPLSEAGAEGQGTSLSFPQITLWQRPLVTVKIEGQLREALLDTGADDTVLEEINL
PGKWKPKMIGGIGGFIKVRQYEQVAIEICGKKAIGTVLVGPTPVNIIGRNILTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKI
KALTEICIEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVSVLDVGDAYFSVPLDKD
FRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEMIIYQYMDDLYVGSDLEIGQHRAKIEELRAHLLRWGFT
TPDKKHQKEPPFLWMGYELHPDKWTVQPVKLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTKEAELELAENR
EILREPVHGVYYDPSKDLIAEIQKQGPDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIATESIVIWGKIPKFRLPIQKETWE
TWWTEHWQATWIPEWEFVNTPHLVKLWYQLETEPIAGAETYVDGAANRETKIGKAGYVTDRGKQKVVSLTETTNQKTELQAIYLALQDSGL
EVNIVTDSQYALGIIQAQPDKSESELVNQIIEELIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHNNWRAMA
SDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKMIHT
DNGSNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLRTAVQMAVFIHNEKRKGGIGGYSAGERIIDIIATD
IQTKELQKQISKIQKFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 118A

75. 2003_CON_01_AE pol.PEP

FFRENLAFQQGKAGEFSSEQTRANSPTSRKLGDGGRDNLLTEAGAERQGTSSSFSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIDTVPVTLKPGMDGPKVKQWPLTEE
KIKALTEICKEMEEEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
ESFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRIKNPEMVIYQYMDDLYVGSDLEIGQHRTKIEELRAHLLSWG
FTTPDKKHQKEPPFLWMGYELHPDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVPLTEEAELELAE
NREILKTPVHGVYYDPSKDLVAEVQKQGQDQWTYQIYQEPFKNLKTGKYARKRSAHTNDVRQLTEVVQKIATESIVIWGKTPKFRLPIQRET
WETWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAASRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEELIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRT
MASDFNLPPIVAKEIVANCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAAEVIPAETGQETAYFLLKLAGRWPVKVI
HTDNGSNFTSAAVKAACWWANVRQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

SUBSTITUTE SHEET (RULE 26)

Fig. 117B

2003_CON_H pol.OPT

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TTCTTCCGGAGAACCTGGCCTTCCAGCAGCCGCCGGAGGCCCGCGAGGCCCGAGCAGGCCCGGCGCCCACCTCCCCGCGAGCTGCGCGTGCG
CCGCGGGCGACGACCCCGTGCCGCGGAGGCCGGGCCGAGGGCCAGGCCACCTCCCTTCCCCAGATCACCCCTGTGGCAGCCCCTGTGACCGTGA
AGATCGGAGGGCCAGCTGCGCGGAGCCCTGCTGACACCGGCCGACACCGTGCCCGGCGAATCAACCTGCCCGGAGGAGATCAACCTGGAAGCCCAAGATGATC
GGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGCAGGTGGCCATCGGGCAAGAAGGCCATCGAGACCGTGCCCGTGTGGTGGGCCCACCCC
CGTGAACATCATCGGCCGCAACATCCTGAGCCTGGCTGCACCCTGAACTTCCCCATCCCCCATCGAGACCTCCCCATCCCCCGTGACCCCGGCA
TGGACGGCCCCCAAGGTGAAGCAGTCAGTGCCCCCTGACCAGCAGTGCCCTGACCATCGAGATGGAGAAGGCAAGATCTCCAAG
ATCGGCCCCGAGAACCCCTACAACCCCATCTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTTCCGCGAGCTGAACAAGCG
CACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCGCCTTCCAGTACGTGGACCGCTACCAGTACAT
CCGTGCCCCTGGACAAGGACTTCCGGCCAGTCCTGGCTCCGAGATCCTGGCCAAGATCCTGGAGCCTTCACCACCCCCG
CAGGGCTGGAAGGGCTCCCCCGGCTCCGACCTGGGACATCGGCCAAGGCTGGCTGGCTTGGGCAAGCTGCTGGCGCGG
GGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAAGATCGAGGAGCTGGCTGGCGCCTGAAGGAGCTGGCGCGGTACT
ACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGGCAAGGCCCCAGCTGAACTGGCCCGAGAACCGGGCATCAAGAACCGGCCCCTGCA
TGGACCGTGAACGACGATCATCGTGACCGACATCGTGTACCCGGCTGGCCCCGAGAACCGCGTGAAGACCGGC
CGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAGATCGGCGAGATCGAGAAGCAGGCCAGTCAGAGAGACCGGC
AAGTACGCCAAGATGCGCCACCGGCCCACCAACCAGGCCGTGAAGCAGCGTGAAGGATCTGGGGCAAGAT
CCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGGACCTGGAGTTCGTGAACACCC
CCCACCTGGTGAAGCTGTGTGGTACCAGCTGGGTACCGCGCGCCGAGCCCATCGCCGAGGCCAAGATCGGC
AAGGCCGGCTACGTGACCGACCGCGGCAAGAAGGTGGTCCCTGACCGAGAAGTGGTCCAGTACCGGTGGCAAGATCTGGC
GGACTCCGGCGCCCTGGAGGTGACCGAGGTGAACATCGTGACCGACTCCCTGGGCGCCGCCAGGCGCTGGTGAACCAGA
TCATCGAGGAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGAGGCCGAGAGCTGGTGTCCTCC
GGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAGCTACCACAACTGGCGCGCCAGTTCAACCT
GCCCCCCATCGTGGCCAAGGAGATCGTGGCCAGCTGCGACAAGTGCCAGCTGAAGGGCGAGCGTGGCATCTGGC
AGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGCGGCTTCATCGAGGCCGAGGTGATCCCCCGCGAGACCGGCCAG
GAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGGTGGCCAGTTCGTGACCGACTCCGGCAACATCCCCCAGTCCCAGTGCCAGCTCCACTTCCCGC
CTGCTGGTGGCCGTGGCCGGGCCACCTGCCGACGCACCTGCGCCACCGGCAGGAGCTGAACAAGCAGAGCTGAAGAAGATCATCG
GCCAGGTGGCGCGCAGCCGCGAGCACCTGCGCACCGGCGAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTACTACGCCGACTC
GGCGAGCGCATCATCGACACTATCATCGCCACCGACATCGCCCCAAGAGCTGCGTGTGGTGAAGGGCCGAGGGCGAGAGGCGGCGAGATCCCGAGATCAGGACAACTCCGAGACCAGCAGGAGTTCGGCGTGTACTACCGCGACTC
CCGCGACCCCATCTGGAAGGGCCCCGCCAAGCTGGACGACGATGGCCGGCGCTGCGTGTGGAAGGTGGTCCCGCCGGACGAGAGGAGACTAA
AGGCCAAGATCATCCCGGCCTACGGCCAAGCAGCAGATGGCCGGCGGCTGCGGCCGCGACTGCCGGCCAGGACGAGGACTAA
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Fig. 118B

2003_CON_01_AE pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGCAAGGCCGGCGAGTTCTCCTCCGAGCAGACCCGGCCACCTCCCGGCCAACTCCCCACCTCCCGGCCAAGCTGGGCGACGG
CGGCCGGCGACAACCTGGCTGCTGACCGAGGCCGGGCGAGCGCCGAGGGCCGGCCACCTCCTCCTTCCCCAGATCACCGTGGCAGCGCCCCTGGTGA
CCGTGAAGATCGGGCGCGGCCAGCTGAAGGAGGCCCTGCTGGACACCGGCCTGAAGCTGGAAGCCCAAG
ATGATCGGGCGGCCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCCAGATCCTGCGGCAGATCTGCGGCAAGAGGCCATCGGCACCGTGCCCGTGACCCTGAAGC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGCAGATCGGCTGCACCCTGAACTTCCCCATCTCCCCCATCGAGACCGTGCCCGTGAAGCTGAAGCCCGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAAAAGATCAAGGCCCTGACCGAGATCTGCAAGGAGATGGAGGAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCGGCAGGCCTTCACCATCCCCAGTACTACACCGCCTTCCGCTGGACCGACACGGCCTTCCGTGCCCCTGGACGAGTCTCCCCGCCAATCTTCCAGTGCCATCTTCCGCCATCTTCCAGTGACCAAGATCCTGGAGCCCTTCCGCGCACAGAACCCCGAGATGGTGATCTACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGGCAGCACCGCACCAAGATCGAGGAGCTGCGGCAGCACCTGCTGCGGCTGGGCTTCACCA
CCCCCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCATCCAGCTGCCCGAGAAG
GACTCCTGGACCGTGAACGACATCCAGAAGCTGGTGGGCAAGCTGAACTGGGCCTCCCAGATCTACCCCGGCATCAAGGTCATCAAGCTGTGCAAGCTGCT
GCGGGGCGCCAAGGCCCTGACCGACATCGTGCCCCTGACCGAGGAAGCTGAGCGGCCAGCTGGAGTCCATCGTGCTGACCGAGGAGGCCGAGCTGGAGCTGGCAGAGAACCGGGAGATCCTGAAGGAGCCTGTGCACGGCGTGTACTACGACCCCTCCAAGGACCTGGTGGCCGAGATCCAGAAGCAGGGCCAGGGCCAGTGGACCTACCAGAT
ACCGGCAAGTACGCCCGCAAGCGCTCCGCCCACACCAACGACGTGAAGCAGCTGACCGAGGTGGTGCAGAAGATCGCCACCGAGTCCATCGTGATCTGGGG
CAAGACCCCCAAGTTCCGCCTGCCCATCCAGCGCGAGACCTGGGAGGACCTGGTGGATGGAGCTGGCGGCTGGACCTTCTACGTGGACGGCGCCGCCAACCAGAAG
ACACCCCCGGGCAGGCCGGCTACGTGACCGACCGCGGCCGCCAGAAGGTGGTGTCCCTGACCGAGACCACCAACCAGAAGACCGAGCTGCACGCCATCCACCTGGC
CTGGGGCAAGGCCGGCTACGTGACCAACCTGGTGAAGCTGTGTCCTGGAGGTGAACATCGTCAGAGGTGAACATCGTGCCCGAGGTGAACGAGCAGTGGTG
ACCAGATCATCGAGGAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCTCCGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACTCCAACTGGCGCGCCATGGCCTCCGACTT
CAACCTGCCCCCGGTGGTGGCCAAGGAGATCGTGGCCAGCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCAGCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGGTGATCCTGGTGGCCGTGCACGTGGCCAGCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACC
GGCCAGGAGACCGCCTACTTCCTGCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCCGCCGTGAA
GGCCGCCTGCTGGTGGCCCGTGCGGCCGAGCATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTACCG
TCATCGGCGAGTACGGCAAGCAGATGGCCGGCGCCGACTGCGTGGCCGGCCGGCAGATCCTGTTCCTGGACGGAAGGGCCGAGGGCGCCGTCGTCGTACCG
CGACTCCCGCGACCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCGGCCGACTGCGTGGCCGGCCGGGCCGTGGGGGCGCCCCC
GCCGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGCCGACTGCGTGGCCGGCCGGCAGATCCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTAC
GCCGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACTGCGTGGCCGGCCGGCCAAGAGCAAGATCCCCAGGAGGACGAGGACTAA
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Fig. 119A

76. 2003_CON_02_AG pol.PEP
FFRENLAFQQGEARKFSSEQTGTNSPTSRELWDGGRDNLLSEAGTEGQGTISSFNFPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEEI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTDICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQASMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGAKALTDIVTLTEEAELELAE
NREILKEPVHGVYYDPTKDLIAEIQKQGQDWTYQIYQEPFKNLKTGKYAKMRSAHTNDVKQLTEVVQKVATESIVIWGKTPKFRLPIQRET
WEAWWMEYWQATWIPEWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSLTETTNQKTELHAIHLALQDS
GSEVNIVTDSQYALGIIQAQPDRSESELVNQIIEKLIEKDKVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHERYHSNWRA
MASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVI
HTDNGSNFTSAAVKAACWWANVTQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGYSAGERIIDIIA
SDIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDS

Fig. 120A

77. 2003_CON_03_AB pol.PEP
FFRENLAFQQREARKFSSEQTRAISPTSRKLWDGGRDNPLPETGTEROQTASSFNFPQITLWQRPLVTVRIGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVTLKPGMDGPKVKQWPLTEE
KIKALTDICKEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
QDFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIGQHRTKIEELRQLCKLLRGAKALTEVIPLTAEEAELELAE
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVRQLCKLLRGAKALTEVIPLTAEEAELELAE
NREILKEPVHGVYYDPSKDLVAEIQKQGQGQWTYQIYQEPFKNLKTGKYARLRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKLPIQKET
WETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKSGKAGYVTDRGRQKVVSLTDTTNQKTELQAIHLALQDS
GLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVDKLVSAGIRKVLFLDGIDKAQEAHEKYHSNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFVLKLAGRWPVKII
HTDNGSNFISTAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKQLKQIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIA
TDIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNNDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDEDS

Fig. 119B

2003_CON_02_AG pol.OPT

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TTCTTCCGGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCCAAGTTCTTCCTCCGAGCAGACCGGCACCAACTCCCCGCACCTCCCGCGAGCTGTGTGGGACGG
CGGCCGCGACAACCTGCTGTCCGAGGCCGGCACCGAGGGCCAGGGCCAGTTCCCCCAGATCACCCTGTGGCAGCGCCCCTGGTGA
CCGTGCGGCGGCCATCGGCGGCTGATCGAGGCCTGCTGGACGACCGGGCCGACGACACCGGCCTGCTGGACTGCTGGAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCGACCAGATCCTGATCGAGAAGGCCAAGAAGGCCATCGGCACCGTGCTGGTGGGCCC
CACCCCCGTGAACATCATCGGCCGCAACATGCTGACCCAGATCGGCTGCACCCTGAACTTCCCCATCTCCCCGACCGTGCCCGTGAAGCTGAAGC
CCGGCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAAGATCAAGGCCCTGACCGACATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAACCCCTACAACACCCCGGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAA
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTTCCGCAAGTACACCCCCTTCACCATCCCCGTGAACAACGAGACCCCGGCATCCGCTACCAGTACAACGTG
ACTTCTCCGTGCCCCTGGACAAGGACTTCCGCCATCTTCCAGGCCTTCCAATGACCAAGATCCTGGAGCCTCCACGATCGTGATCTACCA
CTGCCCCCAGGGCTGGAAGGGCTCCCCGGCCATCTTCCAGGCCTTCCAATGACCAAGATCCTGGAGCCGCACCTGCTGCGCTTCACCA
GTACATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCTGAGGAGCTGCACCAGAAGCTGCTGCCCGAGAAG
CCCCCGACAAGAAGCACCAGAAGAGCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAGCCCCTGCCCGAGCTGCT
GACTCCTGGACCGTGAACGACATCCAGAAGCTGCTGGAGCTGGGCCAGGCCCTGAACCTGGACCAGATCTACCCGGAGCACCTGAAG
GCGCGGCGCCAAGGCCCTGACCGACGTGATCCCGCTGACCGAGGAGGCCGAGCTGGAGCTGGCCGAGAACCTGAAGACCTGGG
TGTACTACGACCCCACCAAGGACCTGATCGCCGAGATCCAGAAGCAGGGCCAGGGCTACTACCAGGAGCACCTTCAAGAACCTGAAG
ACCGGCAAGTACGCCAAGATGCGCTCCGCCCACACCAACGACGTGAAGCAGCTGACCGAGGTGGTGCAGAAGGTGGCCACCGAGTCCATCGTGATCTGGGG
CAAGACCCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGGCCTGGTGGATGGAGTACTGGCAGGCCACCTGGATCCCCGAGTGGGAGTTCGTGA
ACACCCCCCCGCTGGTGAAGCTGTGGTACCAGCTGGAGAAGGACCCCATCGTGGGCGCCGAGAACCGCGAGACCAAG
CTGGGCAAGGCCGGCTACGTGACCGACCGCGGCCGCCAGAAGGTGGTGTCCCTGACCGACACCACCAACCAGAAGACCGAGCTGCAGGCCATCCACCTGGC
CCTGCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCCAGGCCCAGCCCGACCAGAGCGAGTCCGAGCTGGTGAA
ACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGGCAGGTGGACAAGCTGGTG
TCCAACGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGCGCTACCACTCCAACTGGCGCGCCATGGCCTCCGACTT
CAACCTGCCCCCCATCGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCTCCGGCTACATCGAGGCCGAGGTGATCCCCGCCGAGACC
GGCCAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGGTGATCCACACCGACAACGGCTCCAACTTCACCTCCGCCGCTGAA
TCATCGGCCAGGTGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGCAAGGGCGGCATCGGCGGCTAC
TCCGCCGGCGAGCGCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTACCG
CGACTCCCGCGACCCCATCTGGAAGGGCCCGGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGCCCC
GCCCGGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGCCGACTGCGTGGCCGGCCGCCAAGGACGAGGACTAA
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Fig. 120B

2003_CON_03_AB pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGCGCGAGGCCCGCAAGTTCTCCTCCGAGCAGCAGACCCGCGCCATCTCCCCCACCTCCCCGCAAGCTGTGGGACGG
CGGCCGCGACAACCCCCTGCCCGAGACCCGCGCACCGAGCGCGCCAGGCCCGAGCGCGCCACCGGCCCTGCCCGACGACACCGTGCTGGAGGCACTTCCCCGAGGTGGCAGCGCCCCTGGTGA
CCGTGCGCATCGGCGGCGGCCAGCTGAAGGAGGCCCTGCTGGACACCGGCGCGGCAGATCCTGACCGGCCAAGTGCGCCAGTACGACCAGATCTGCGGCAGAGGCCATCGCCCGCAAGTGGAAGCCCAAG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCTGCGGCAGAGGCCATCGCCCGCAAGTGGAAGCC
CACCCCCGTGAACATCATCGGCCCGCAACATGCTGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGGGCAAGATC
TCCAAGATCGGCCCCGAGAAC CCCTACAACACCCCCGTGTTCGCCATCAAGAAGAAGGACTCCACCAAGTGGCGCAAGTTCCCGCGAGCTGAA
CAAGCGCACCCAGGAGACTTCTGGGAGGTGCAGCTTCCGCAAGTACAGACCCCGGCCATCCCCACCCGCCTTCACCATCGGCAGCGTCCGGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGAAGGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCCCGAGATCGTGATCTACCA
CTGCCCCAGGGCTGGAAGGGCTCCCCCGCCAGCTTCCAGTGGCTCAGGCCGAGCACCTGCTGCGCCTCAGCGTGCTGCAAGCTGCT
GTACATGGACGACCTGTACGTGGGCGTGCCCCTTCCTGTGGGCAAGCTGGTCCCCGAGATCTACGCCCGAGATCTGCTGCCCGAGAAG
CCCCCCGACAAGAAGCACCAGAAGAAGGAGCCCTTCCTGTGGAAGGGCAAGCCCCTTCCAGAAACCTGAAGG
GACTCCTGACCGTGAACGACACCCCCGGCCCTGAGGGTGATCCCCCTGACCGAGCTGGCAAGCTGGAGCTGGACCGGCCAGCACCGCC
GCGCGGCGCCAAGGCGCTGACCGAGGTGATCCCCTGACCGAGAAGCAGGGCCAGGTGAGCTCAGAGAACCGCGAGAACCTGAAG
TGTACTACGACCCCCTCCAAGGACCTCGGTGGGCGCCCACCACCAGAAGAGACGCCGTGCAGAGATCGCCACCGAGTCGATCTGGGG
ACCGGCCAAGTACGCCCCTGCCGCGCTACGTGGCCCGCCATCCAGAAGTTCAAGCTGCCCATCCAGAAGGAGAACCAGAGACCCAAG
AACACCCCCGGCCAAGTTCAAGCTGCCCATCCAGAAGTTCAAGCTGCCCATCCAGAAGGAGAACCAGAGACCCAGCTGCCATCCACCTGGC
TCCGGCAAGGCGCTACGTGGCCCGCGGCTACGTGGACGAGGTGAACATCGTGACCGACTACGGCCTGGTGTCCCTGACCGCCGAGCTCCGAGCTGGTGT
CCTGCAGGACTCCGGCCTGGAGGTGAACATCGTGACCGACTACGGCCGCATCGGGCATCCGAGCTGCGGCAACGAGCAGTCGTG
CCCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGGCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTG
TCCGCCGCATCGCCCCCCGTGGTGGCCAAGGAGATCGTGTGCTTCCTGGAGGAGATCGTGTGCGCCAGGTGGACTGCTCCCCCGGCA
CAACCTGCCCCTGGGGACGTGGCCCAGCTCGTGTGCCTGGCCGTGCAAGTGCCCGTGGCCGGGCCTGAAGGGGCCGAGGTGATCCCCGCCCCCGAGACC
TCTGGCAGCTGGACTGGACCGCCCTACTTCGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGTGGACTGCTCCATGGCCGTGCTGCCCCCGGCA
GGCCAGGAGACCGCCTACTTCGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGTGGACTGCTCCATGGCCGTGCTGCCCCCGGCA
TCATCGGCCTGGGGGCTGCGCCGACCAGGGCCAGATCATCGCCACCGACATCATCGCCAGTCCCCAGTGGCCGTGGTGTTCATCCACAACTTCAAGCGCAAGGGGCGGCTAC
TCCGCCGGCCAGGTGACTCCGGCCCCATCTGCTGCACGGGCCCCGGCCAAGCTGCTGTGGGAAGGGCGGCGAGGGCGACTGCCTGTGTACTACCG
CGACTCCCGGCCAAGGCCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGAGGGCGGCCAAGCTCCCGCGGTGTACTACCG
GCCGCCAGGCCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGAGGGCTGCGGCTGCCTCCCCCGGCCGACGAGGGACTAA
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Fig. 121A

78. 2003_CON_04_CPX_pol.PEP
FFRENVAFQQREARKFSSEQARANSPARRELRDERGDNLLSEAGTEGQGTISFNFPQITLWQRPLVTIKIGGQIREALLDTGADDTVLEEIN
LPGKWKPKMIGGIGGFIKVRQYDQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKNSTRWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDP
EFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRTKNPEIVIYQYMDDLYVGSDLEIGQHRAKIELREHLLRWGF
STPDKKHQKEPPFLWMGYELHPDKWTVQPIQLAEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTTEAELELAEN
REILKEPVHGAYDPSKDLIAEIQKQGQGQWTYQIYQEPYKNLKTGKYAKTRSAHTNDVRQLTEAVQKIAMECIVIWGKTPKFRLPIQKETW
DTWWTEYWQATWIPEWEFVNTPPLVKLWYQLETDPIAGAETFYVDGAASRETKQGKAGYVTDRGRQKVVSLSETTNQKTELQAIYLALQDSG
SEVNIVTDSQYALGIIQAQPDRSESDLVNQIIEQLIQKDKVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCNKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKIIH
TDNGPNFTSAAVKAACWWADIQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 122A

79. 2003_CON_06_CPX_pol.PEP
FFRENLAFQQGEAREFSSEQARANSPTRRELRVRRGDSPLPEAGAEGQGAISLSFPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEDIN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMIKILEPFRIKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPHKNLKTGKYARIKSAHTNDVKQLTEAVQKIALESIVIWGKTPKFRLPIQKETW
ETWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIVGAETFYVDGAANRETKKGKAGYVTDRGRQKVVSLTETTNQKTELQAINLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSTGIRKVLFLDGIDKAQEDHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$

Fig. 121B

2003_CON_04_CPX pol.OPT

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TTCTTCCGCGGAGAACGTGGCCTTCCAGCAGCGCGAGGCCCGCGAGGCCCGGCCGCCCGCCGCCCGCCGAGCTGCGCGACGA
GCGCGGCGACAACCTGCTGTCCGAGCGCGAGGGCCGAGGGGCCAGGGCCAGCACCAGGGCCACCAGGGCCAGGCGCCCCTGGTGACCA
TCAAGATCGGCGGCCAGATCCGCGAGGCCCTGCTGGACACCGGCCCTGCTGGAGGAGATCAACCTGCCCGGCAAGTGGAAGCCCAAGATG
ATCGGCGGCATCGGGCGCTTCATCAAGGTGCGCCAGTACGACCAGATCTGCGCAAGAAGGCCATCGGCAAGAAGGCCGTGCCCGTGGTGGGCCCAC
CCCGTGAACATCATCGGCCGCAACATGTGGCCGCAACAATCATCGGCCACTGACCCAGCTGACCGCTGGGCTGAAGCTGAAGCTGAAGCTGAAGATCTCC
GCATGGACGCGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGAAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGAAGGAGAGGCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACAACACCCCAGTTCTGGAGGTGCAGCTGGGCATCCGCACCCGCGCCATCCCCTCACCATCTCCGCGCCTTCACCGTGCTG
GCGCACCCAGGACTTCTGGAGGTGCAGTTCCGCCAAGTACACCCGCCATCTTCCAGTGCTTCCATGACCAAGATCCTGGAGCCTTCGCTGCTGTGGGCTTCTCCACCC
TCTCCGTGCCCCTGACCCCGAGTTCCGCCGCCATCTTCCAGTGCTTCCATGACCAAGATCGGCAGCAGCCCTTCCTGTGGGATGGCTACGAGCTCCGTGACCCGCGGCTCCGA
CCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCCGACCTGGAGATCGGCAGCAGCCCTTCCTGTGGGATGGCTACGAGCTGCAAGCTGTGCAAGCTGCTGCG
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCAGCAGCCCTTCCTGTGGGATGGCTACGAGCTGGCAAGCTGTGCAAGCTGGGGCAA
CCGACAAGAAGCACCAGAAGAGCCCCTTCCTGTGGGATGGCTACGAGCTGGCAAGCTGTGCAAGCTGTGCTGGGCTTCTGGGGAGTTCGTGAACA
TCCTTGGGACCGTGAACGAAGCATCCAGAAGCTGGTGGTACGGCGCGGCCGACCCCATCGCCCGGCGGCCATCTACCTGGCCCT
CGGCGCCAAGGCCCTGACCGTGCTGGACCGCGTCCCTTCCCGTGTCCGAGAGCTGGAGCTGCACGGCGCCT
ACTACGACCCCTCCAAGGACCTGATCGCCCGCCACCAACGACGTGCCGCGAGGCCGTGACCGCCGTGCATCGTGATCTGGGGCAA
GGCAAGTACGCCAAGACCCGCTTCCGCCCAGAAGGAGACCTTCTACGTGGACGCCGTCATGAGCCACGTACTGGACGACCAAGCCAG
GACCCCAAGTTCCGCCTGCCCATCCAGAAGGAGACCTGGGAGACCTGGGACTGGCCGCCCATCGCCCGGCCATCTACCTGGCCCT
CCCCCCCCCCTGGTGAAGCTGTGGTACGACCGCGGCCGCCCAGAAGGTGTCCCTGCCCATGCTCCAGTCCGACCTGGTGAACC
GGCAAGGCCGGCTACGTGACCGACCGCGAGGTGAACATCGTGACCGAGAACATCAGGCCCGCCATCGTGGGTGCCCGCCCAGAAGTCGGTGTCC
GCAGCATCATCGAGAGCGCCTGATCCAGAAGGACAGGTGTACCTGTCCTGGGTGCCCGCCATGCTCCAGTGGGTGACAAGCTGGTGTCC
AGATCATCGAGACGGCCCTGATCGCCCGCCACCAACGACGTGTTCATCCACAAGTTCATCGAAGCTGATGAACAAGAGCTGAAGAGATCA
AACGGCATCCGCAAGGTGCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGCACGAGAAGTACCACAACAACTGGCGCGCCCATGGCGGCCATCGGCGGCTACTCC
CCTGCCCCGTGGTGGCCAAGGAGATCGTGGCCTCCTGCAACAAGTGCCAGGTGAAGGGCGAGGCCCTCCGGCATCGAGGGTGATCCGCCCGCATCT
GGCAGCTGGACTGCACCCACGAGGGCAAGATCATCCTGGTGGCCGTGCACGTGGCCAGCGGCTTCATCGAGGCCGAGGTGATCCCCGCCGAGACCGGC
CAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGCTGGCCCGTGAAGACCATCCACACCGACAACGGCTCCAACTTCACCTCCGCCGTGAAGGC
CGCCTGCTGGTGGCCATGGGCATCAAGCAGAAGACCCTCCAGTCCCAGGCCGTGGTGGGAGTCCATGAACGCCATGCTGAAGAGCTGATCA
TCGGCCAGGTGCGCGACCAGGCCGAGCACCTGAAGACCGCCGTGCAGATGGCCGTGTTCATCCACAACTTCAAGCGGCGGCGGTCCGGCATCAAGGAGCTGGTGCGCTACTCCGA
GCCGGCGCCGAGGCCATCATCGACATCATCGCCACCGACATCCAGACCAAGGAGCTGCAGAAGCAGATCACCAAGATCCAGAACTTCCGCGTGTACTACCGCGA
CTCCCGCGACCCCATCTGGAAGGGCCCCGCCAAGCTGCTGTGGAAGGGCGAGGGCGCCGTGGTGATCCAGGACAACTCCGACATCAAGGTGGTGGCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCAGCAGGCAGGACTAA
```

Fig. 122B

2003_CON_06_CPX pol.OPT

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TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGAGTTCTCCTCCGAGCAGGCCCGCGCGCCAACTCCCCACCCGCGCGCGGAGCTGCGCGTGCG
CGGCGGGCGACTCCCCCGTGCCCGAGGCGGCGGCCCGAGGGCCGGAGGGCCGCCATCTCCCTGTCCTTCCCGAGATCACCCTGTGTGGCAGGCCCCGTGTGACCG
TGCGCATCGGCGGGCCAGCTGATCGAGGGCCCTGCTGGACACCGTGCTGGAGGACATCAACCTGCCCGGCCAAGTGGAAGCCCAAGATG
ATCGGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGATCGAGATCTGGCGGCAAGAGGCCATCGGCACCGTGCCCGTGGTGGCCCCAC
CCCGTGAACATCATCGGCCGCAACATGCTGGCCGCGACACCATCTCCCCATCTCCCCCATCCCCCGAACTTCCCAGCCCTGACCGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATCAAGGCCCTGACCGAGATCTGAACAA
AAGATCGGCCCGAGAACTGGCTGGGCGACAGAACCCCTCAACACACCCCATCTTCGCCATCAAGAAGAAGACTCCACCAAGTGGCCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCCAGGAGCTTCTGGGAGGTGCAGCTGCAGCTGGCCAAGTTCCGCAAGTACACGACCCCCGGCCATCCCCTTCACCATCCCCATCAAGAAGATCGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCGCCATCTTCCAGTCCTCCATGATCAAGATCGGCCCCAGAGATCGGGCGAGCACCTGCTGAAGTGGGGCTTCACCACCC
CATGGACGACCTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCTGCCGCCAGTGGGCTACGAGCTGCCCGACCAAGGAC
CCGACAAGAAGCACCAGAGGAGCACCCCTTCCTGTGGATGGCGTACGAGCTACGAGCTCCCCGAGATCTACCCCGAGATCTACCCCGGATGGGCCAAGCTGGCCTGTGCTGCGCG
TCCTGGACCGTGAACGACACATCCAGAAGCTGGTGTGCCCGAGGGCCAAGCTGGGCCATCAAGGTGAACGTACCCCGGCATCAAGTGAAGCAGCTGTCTGCGCG
CGGCGGCCAAGGCCCTGACCGTGCCCCTGACCGCCGACATCGTGCCCGAGCTGGCCAGCTGGCCAGCGGCCAGTCCCGAGAACCGGCGAGATCCTGAAGGAGGCGCCCACAAGAGAACCTGAAGACC
ACTACGACACCCCTCCAAGAACCTGATCGCGCCCACCACACCAAGGCCGTGAAGCAGCGTGACCGAGAAGATCGCCCTGGAGTCCATCGTCGTGGGGCAA
GGCAAGTACGCCCGCATCAAGTCCGCCTGCCCATCCAGAGGAGGACCTGGTACTGCGCGCCCTGATCCCCCGCCAACCGCGAGACCAAGAAG
GACCCCAAGTTCCGCCTGCCCATCCAGAAGGAGGACCTGGAGATCGGCGCCCATCGTGGGGGGCGCCAACCGCGAGAGCTGCAGGCCATCAACCTGCCCCT
CCCCCCCCTGGTGTGGAAGCTGTGGTACCAGCCGGCGCGCCAGAAGGTGTGTCCCTGACCGAGACCGACTCCCCAGTACCGCCACTCGTCCTGGGTGCCCGGGCCCATCGTGGGGGCGCCGAGCTGGTGAACC
GCAGGACTCCGCCTGCCGAGGTGAACATCGTGACCCTGTCCTGGGTGCCCGCCAGAGGACCACGACAAGGCCGCTACCACTGGCCGCCATGGCCCTCCGACTTCAA
AGATCATCGAGCAGCTGATCAAGAAGGAGAGCTGTTCCTGGACGGCATCGACAAGGCCTGGCTACCACTGGCCGCCATGGCCCTCCCCCGGCATCT
ACCGGCATCCGCAAGTCGTGGCCAAGGAGATCGTGCCCATCGGCGACCTGTGGCCGTGAAGTGCCAGCTGCCGAGCTGCCCGAGAGCTGCCCGGCCGAGACCGGC
GGCAGCTGGACTGCGGCTACGGCTGACGAGTGAACATCGTGACCTGACCGAGCATCATCGTGACCCGCCCCAACTGCAAGGCGCTGGAAGGTGTGGAGTCCATGAACCCCCAGTTCCTCATCCCCTGTTCATCCACAACAGGCCGCTACTCC
CAGGAGACCGCGCCTACTTCATCCTGGAAGCTGCGCCGGCCAACATCACCAGGAGTTCGGCATCACCCCAGAGTTCAAGCGCAAGGGGCGCATCGCGGCTACTCC
TCGGCCAGTGCGGCGACCAGCCGAGCACCTGCGCCACCTGTTCATCCAGAAGATGGCCCGTGTTCATCCACAACTTCACCCAGGAGTTCCGCGTGTACTACCGCGA
GCCGCGCAGCGCCATCATCGACATCATCCGCCTCCCCGCCCAAGGCCCTGCAGAAGCTGCGTGGTGGAAGGGCGAGGGGCGCGTGTGAAGGTGTGCCCCGCC
CTCCCCGCGACCCATCTGGAAGGGCCGGCCTACGGCCAAGCTGCGTGGTGGTGGTGGAGGACTGCGGCCCGCCGCGCTGGGAAGGTGTGCCCCGCC
GCAAGGCCAAGATCATCCCGCGACTACCGGCAAGCAGCAGATGGCCGGCGACTGCGCGTGCGGCGGCGACGACTGGCCCGCCCAGGACGAGGAGGACTAA
```

Fig. 123A

80. 2003_CON_08_BC pol.PEP

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FFREILAFPQGEAREFPPEQTRANSPTSRELQVRGDNPSSEAGTERQGTLNFPQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEVNLPG
KWKPKMIGGIGGFIKVRQYEQIPIEICGKKAIGTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKA
LTAICDEMEKEGKITKIGPDNPYNTPIFAIRKKDSSKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFR
KYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELREHLLKWGFTTP
DKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAENREI
LKEPVHGAYYDPSKELIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVIWGKIPKFRLPIQKETWETW
WTDYWQATWIPEWEFVNTPPLVKLMYQLEKDPIAGVETFYVDGAANRETKIGKAGYVTDRGRKKIVSLTDTTNQKTELQAIYIALQDSGSEV
NIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKERVYLSWVPAHKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHSNWRAMASD
FNLPPIVAKEIVASCDQCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIHTDN
GSNFTSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKLIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQ
TRELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIKDYGKQMAGADCVAGRQDED$
```

Fig. 124A

81. 2003_CON_10_CD pol.PEP

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FFRENLAFQQRKARELPSEQTRANSPTSRELRVWGGDNTLSETGAERQGAVSLSFPQITLWQRPLVTVKIGGQLKEALLDTGADDTVLEEMN
LPGKWKPKMIGGIGGFIKVRQYDQILIEICGYKAIGTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLYE
DFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPEMVIYQYMDDLYVGSDLEIGQHRIKIEELRGHLLKWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELAEN
REILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPHKNLKTGKYAKRRTAHTNDVKQLTEAVQKIAQESIVIWGKTPKFRLPIQKETW
ETWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVISITDTTNQKTELQAINLALQDSG
SEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHNNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEALHGQVDCSPGIWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVVH
TDNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAT
DIQTKELQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIKDYGKQMAGADCVASRQDEDQ
```

Fig. 123B

2003_CON_08_BC pol.OPT

TTCTTCCGCGAGATCCTGGCCTTCCCCCCGAGGGCGGAGGCCCGCGAGCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCAGGTGCG
CGGCGGACAACCCCTCCTCCGAGGCCGGCCGGCCGAGCGCCGAGGCCAGGGCCACCCTGGGCAGCCGCCCCTGGTGTCCATCAAGGTGG
GCGGCCAGATCAAGGGAGGCCCTGCTGGACACCGGCGACACCCGTGCTGGAGGAGGTGAACCTGCCCGGCAAGGCCATCGGCCACCCCGTGAA
ATCGGCGGCTTCATCAAGGTGCGCCAGTACGAGCAGATCCCCACCCTGAACTTCCCCATCTCCCCATCTGAGACTTCGAGCCCGTGAAGCCGTGGGCCATGCGACG
CATCATCGGCCGCAACATGCTGACCCAGCTGGGCTTGACCCAGCTGAACCAGCTGCTGACCGGACGAGATGGAGAAGAGGAGGCAAGATCACCAAGATCGGC
GCCCCAAGGTGAAGCAGTCAGTGCCCCTGACCGAGGAGAGAGATCAAGGCCCTGACCATCTGCCGACGAGAGCTGGCGTGGGAGCTGAACAAGCGCACCCA
CCCGACAACCCTACACACCCCTACACACCCCCATCTTCGCCATCCGCACCCCGCCGGCCATCCCCACCCCGCCTTCACCAGTACACGTGCTGCCCCAGGGC
GGACTTCTGGGAGGTGCAGCTGGGCCATGCAGACACCCGCTGGGCATCGGGCTACCAGTACAACGTGCTGCCCCAGGGC
CCCTGGACAAGGACTTCCGCAAGTACACACTTCCAGTGCTCCATGACCAAGATCCTGGAGCCTTCCGCGAGCTGCCCGAGCACCTGGACACCCGACAAGA
TGGAAGGGCTCCCCCGCCATCTTCCGACCTGGAGATCGGCCAGCGACCACCCGAAGATCGAGATGGGCCTTCACCACCCCCGACAAGA
CCTGTACGTGGGCTCCGACCTGGAGATCGGCTACGAGCTGCTGATGGGCTACGAGAGCTGCCCTCCGACCTGTGCAAGCTGCTGCGGCGCGCCAA
AGCACCAGAAGGAGCCCCCCTTCTGTGTGGGCAAGCTGGTGCCCCTGACCGAGGAGCCCGAGCTGGACAGCGCCCCAGCTCTGTGTGCAAGCTGTGCACGGCGCCTACTACGACC
GTGAACGACATCCAGAGACGCGCCAGCATCCCCGAGATCTACCCCGGCTGGGCCTCCCAGATCTACCCCGAGAACCTGAAGAACCTGGCAAGTAC
GGCCCCTGACCGTGCCGCCAGGAGGCCGAGCTGGACAGCTGACCGCCAGTGACTGGAGGAGCCCTTCAAGAACCGGCAAGTAC
CCTCCAAGGAGGAGTCGATCGGCCGCCGCCCCAGCATCGAGCGCGCCAGATCTACCAGAGAATCGCCATGACCGCCATGGACATCGTGGGCAAGATCCCCAA
GCCAAGATGCGCCCTGCCATCCAGAAGGAGACGTGAAGCAGTCTGGAGACCTGGTGGAGAAGCAGCCGTGAGCAGTTCGTGAACACCCCCCCCC
GTTCCGCCTGCCATCCAGAAGGAGAGACCTGGAGAAGGACCCCATCGCCGGCGTGGAGACCTTCTACGTGGACGGCGCCAACCGCAACATCGGCAAGGCC
TGGTGAAGCTGTGGTACCAGCTGGAGAAGCCGCGGCCGCAAGAAGATCGTGCCCTGACCGACACCAGAGAACAACCGGAGCTGCAGCGGCATCTACATCGCCCCTGCAGGACTC
GGCTACGTGACCGACCGGCGCGCCGACTCCCAGTACGCCTGGGCATCATCGACAGGTGCATCGGCTGGGTGGAGCTGGTTGTCCAACGGCATC
AGCAGCTGATCAAGAAGAAGGAGCGCGTGTACCTGTCCTGGGTGCCCGCCCCACAAGGGCATCGGCGGCATCCCCACTCCAACTTCAACCTGCCCCCC
CGCAAGGTGCTGTTCCTGGACGGCGCATCGACAAGGCCCAGGTGGCCTGACAGTGCCGTGCTGCGGCCATCTGGCAGCTGG
CATCGTGGCCCAAGGAGATCGTGGCCTCCTGCTGGACCTGTGGTGCCCGTGCTGCGGCCGTGACGTGAAGGGCCGCCTGCTG
GCCTACTTCATCCTGCTGAAGCTGGCCGAGGAGTTCGGGCCCATCATCGAGCCCGACACGGCGTGGTGAGTTCATGAACAAGGCGGCGGCTACTCCCGCGAG
GTGGGCGACAAGGCCGAGCTGCTGCACCCTGCTGGAAGGGGCCGAGGCGCCCGTGCTACTACCGCGACTCCCGGA
CGCATCGTGGACATCATCGCCCGCCAAGCTGCCGAGCTGCAGGCTGCAGGCTGGCGCCGACAACTCCGACATCAAGGTGGTGCCCCGCCAAGGCCA
CCCCATCTGAAGCTACGGGCGCCGAGCTGCCGCGGGGCCGCGCCGACTGCGTGGCCGCCGACTGGAGGAGGACTAA
AGATCATCAAGGACTACGGCCAAGCAGCAGATGGGCCGCCAAGCAGTCCCC

Fig. 124B

2003_CON_10_CD pol.OPT

TTCTTCCGCGAGAACCTGGCCTTCCAGCAGCCAAGGCCCGCGAGCTGCCCTCCGAGCAGACCCGCGCCAACTCCCCCACCTCCCGCGAGCTGCGCGTGTG
GGGCGGCGACAACACCCTGTCCGAGACCCGTGCCGAGCGCCGGGGCGCCCAGGCGCCGGGCGGCCAGGCGCCGAGCGCCCCTGTCCCCGAGGGAGATGAACCTGCCCGGCAAGTGGAGCCCAAGATG
TGAAGATCGGCGGCCAGCTGAAGGAGGCCCTGCTCTGGACACCGTGCTGGACAGATCGGCTACAAGGCCATCGGCACCGTGCCCGTGCTGTGGGCCCCAC
ATCGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCGGCTGGCGCTACAAGGCCATCGGCTGGCTACAAGGCCATCGGCTGAGATCGGCGGCATCGGCGGCTTCATCAAGGTGCGC
CCCGTGAACATCATCGGCCGCAACCTGCTGACCAAGGCCCTGACCGAGGAGAAGATCAAGGCCCTGACCAGTGCGCAGATCTGCACCGAGATGGAGAAGGAGGCAAGATCTCC
GCATGGACGCGCCCCAAGGTGAAGCAGTAGCAGTGCCCCTGACCGAGGAGAAGATCAAGAAGAAGACTCCACCAAGTGGCGAAGCTTCCGCGAGCTGAACAA
CGCATCGGCGCCCCGAGAACCCCTACAACACCCCATCTTCGCCATCAAGAGAAGAAGTCCGTGACCGTGCTGGACGTGGGCGACGCCTACT
GCGCACCCCAGGAGACTTCTGGAGGTGCAGCTTCCGCCAAGTACACCGTGCTCCTCATGACCAAGATCCTGGAGCCCTTCCGCAAGCAGAACCCGAGATGGTGATCTACCAGTA
TCTCCGTGCCCCTGTACGACGCAGACTTCCGCCATCTCCAGTCCTCGACCTGGGCTCCGACGTGCTCCAGCTGCGCAGCCATCAAGAGATCCTGGAGCCCTTCCGCAAGCAGAACCCGAGATGGTGATCTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCGCCATCTTCGACCTGGGCTCCGACGTGCTCCAGCTGCGCAGCCATCAAG
CATGGACGAGTTGTACGTGGGCTCCGACGAGATGGGCCAGCCTCAGATCTCCAGCTGCGCACCCCGACAAGTGCAGCTGCCCGAGAAGGAC
CCGACAAGAAGCACCAGAAGGAGCCCCCTTCCTGTGGATGGCTACGACGCGCCCCGACATCAAGTGCCGCCAGCTGTGCAAGCTGCTGCG
TCCTGGACCGTGAACGACACATCCAGAAGCTGGTGGTGCCCCTGAACGTGGGCAAGCTGGTGTACCAGCTGGGCCTGACCAAGCTGGTGCACGCGGTGT
CGGCCGGCCAAGGCCCTGACCGTGCCCCTGATCGCCGCCCACAACCGCCCCACCACCAGGAGACTCTACCAGATCTACCACCAGGAGCTGCTGACTGAAGACC
ACTACGACGTACGCCAAGCGCCCACCGCCCCATCCAGAAGCAGCGTGACCGAGGCCGTGACCGAGGCCGTGACCAGAGTCCCGAGTCCCGAGTCGTGAACA
GGCAAGTACGCCAAGGCCTCCAAGCTGGGGAGCTGGTGGAGCGCCGACGGCGCCGACTACTGGCAGACCTTCTCACCAACCGCGAGACCAAGCTG
GACCCCCCGGCCGGGAAGTTCCGCCTGCCATCGAGAAGGAGCCCAGAAGGTGATCTCCATCACCGACCCTGGGCATTCCATCACCGGCCATCAACCTGCCCCT
CCTGCCCCCCGTGGTGCGCCAAGGAGATCGTGCCGGCCTGAGAAGTGCCAGCCCCTGACAAGTGCCAGCCCCATGGGACTGCTGCTCCCCCGGCATCT
GGCAGCTGGACTGCCAAGGTGCTACGTGCGACCGGCGGCGCCGAGCTGAAGTGCCATCGGCGCCCTACATCGGCCGAGACCCGCCGTGAAGC
GCAAGTACGCCTCCGGCTCCGAGTGAACATCGTGACCGACAAGAAGGTGTACCTGTCCTGGGTGCCGCGCCAGGAGAACTGGCCTGCTGGTGAACC
AGATCATCGAGCAGCTGATCAAGAAGAGAAGGACTGCGCAACCGCACCCCGGCATCGAGGCGCTCCAGGTGGAGGGCGCCCTGTACATCGGCGCCGAGACCCGCCGTGAAGGC
TCCGGGCATCCGGCCTTCGCTGAAGCTGGCCGGAGTTCGGCACACTCCCCAGTGCCGCTGACCACGGCGCCCTGCACGCTCCAACTTCAAGCGCGGCTACTCCGGA
CCTGCCCCCCGTGGTGCGCCAAGGAGATCGTGCCGGCCAAGTGCTGGCCCGTGAAGGTGGGCCCGTGAACGCCCCCTACAACCCCCCGTGGCCCATGGCCATCGCCGGCTACTCCGGA
GCCAGGTGGACTGCAAGGTGCTGGCCGGCATCAAGGCCGAGAGTTCGGCCCGAGAACCTGCGCCTGGTGAAGGGCGCCCAGGTGGACTGGTGCCCTACCTGCCTGCTCCCCCGGCATCT
TCGGCCAGGTGCGCGGCGGCATCATCGACATGCCCTGGGCCCGCCCGACCTGCTGTGTGCCGGCGCCGACATCATCGACATGCCCTGGGCCCGCCCGACTGCTGTCCCCCGGCATCT
GCCCCGCGACCCCATCTGGAAGGGCCCGACTGCGTGTGGAAGGGCGAGGGGCGGCGACTGCTGCGGCCTCCCGCGCCGCGCGCCGCCGCCCCCCGCC
CTCCCGCGACATCTGGAAGGTGAAGATCATCAAGGACTACGGCCAAGCAGCAGATGGCCGGCGCAAGCAGCAGATGGCCGGCGCGAGCTGCGCTGTGGAAGGGCGAGGGGCGGCGACTGCTGCGGCCTCCCGCGCCGCGCGCCGCCGCCCCCCGCC
GCAAGGTGAAGATCATCAAGGACTACGGCCAAGCAGCAGATCATCAAGGAGGACGAGGACCAG

Fig. 125A

82. 2003_CON_11_CPX_pol.PEP

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FFRENLAFQQGEAREFSPEQARANSPTSRELRVRGGDSPLPETGAEGEGAISFNFPQITLWQRPLVTIKVAGQLKEALLDTGADDTVLEEID
LPGRWKPKMIGGIGGFIKVRQYEEIIIEIEGKKAIGTVLVGPTPVNIIGRNMLTQIGCTLNFPISPIDTVPVKLKPGMDGPKVKQWPLTEEK
IKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDE
SFRKYTAFTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRTQNPEIVIYQYMDDLYVGSDLEIGQHREKVEELRKHLLKWGF
TTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPDKECWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGTKALTDIVPLTAEAELELAEN
REILKEPVHGVYYDPSKDLIAEVQKQGLDQWTYQIYQEPFKNLKTGKYAKRRTAHTNDVRQLAEVVQKISMESIVIWGKIPKFRLPIQRETW
ETWWTDYWQATWIPEWEFVNTPPLVKLMWYQLEKEPIIGAETFYVDGAANRETKLGKAGYVTDKGRQKVVTLTETTNQKTELEAIHLALQDSG
LEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHERYHSNWRAM
ASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKVIH
TDNGSNFTSAAVKAACWWANIQQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIAT
DLQTKELQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 126A

83. 2003_CON_12_BF_pol.PEP

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FFRENLAFQQGEARKFPSEQARANSPASRELWVRRGDNPLSEAGAERRGTVPSLSFPQITLWQRPLVTIKVGGQLKEALLDTGADDTVLEDI
NLPGKWKPKMIGGIGGFIKVKQYDNILIEICGHKAIGTVLVGPTPVNIIGRNLLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEE
KIKALTEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLD
KDFRKYTAFTIPSVNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCRLLRGTKALTEVIPLTKEAELELAE
NREILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKITTESIVIWGKTPKFRLPILKET
WDTWWTEYWQATWIPEWEFVNTPPLVKLWYQLETEPIAGAETFYVDGASNRETKKGKAGYVTDRGRQKAVSLTETTNQKAELHAIQLALQDS
GSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSAGIRKILFLDGIDKAQEEHEKYHNNWRA
MASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKTI
HTDNGPNFSSAAVKAACWWAGIQQEFGIPYNPQSQGVVESMNKELKKIIRQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIS
TDIQTRELQKQIIKIQNFRVYYRDSRDPVWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED$
```

Fig. 125B

2003_CON_11_CPX pol.OPT

Fig. 126B

2003_CON_12_BF pol.OPT

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TTCTTCCGGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGACCTCCCGCCTCCCGCGAGCTGTGGGTGCG
CCGCGGCGACAACCCCCTGTCCGGAGGCGCCGCGGGCCCGAGCGGCCGGGTGACCGGCGACACCCTGCTGACGCG
CCATCAAGGTGGGCGGCGGCTTCATCAAGGTGAAGCAGTACGACAACATCTGCGGCGACATCTGCGGCGACCGCG
ATGATCGGCGGCATCGGCGGCTTCATCAAGGTGAAGCAGTACGACAACATCTGCGGCGACATCTGCGGCGACCCC
CACCCCCGTGAACATCATCGGCCCAACCTGCTGACCCAGCTGGGCTGACCTGAGAGATCTGCGGCGACATCTGCG
CCGGCATGGACGGGCCCAAGGTGAAGCAGTGGCCCTGACCGAGGAGATCAAGGCCCTGACCGAGATCTGCACCGA
TCCAAGATCGGCCCCGAGAACCCCTACAACCCCGTGTTCCGCCATCCCCGCCGCCTCACCCCCGCCTGGTGGGCG
CAAGCGCACCCAGGACTTCTGGGAGGTGCAGCTGCCCGAGTGGGGCAAGTCCGTGACCGTGGGCGACGCCT
ACTTCTCCGTGCCCCTGGAACCGGAAGACTTCCGCAAGTACACACCCGCTACCAGTACAACGTG
CTGCCCCAGGGCTGGAAGGCTCCCCCGCCATCTTCCAGTCCTCCATGACCAAGATCCTGGAGCCCTTCCGCAAGC
GTACAATGGACGACCTGTACGTGGGGCTCCGGAGATCGGCCACAGGCTGCGCAACCTGCTGCGCTGGGCTTCACCA
CCCCCGACAAGAAGCACCAGAGAAGGAGCCCCCCTTCCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGAAG
GACTCCTGGAACGGCCTGAAGGCCATCCAGGAGGTGTGGGCAAGCTGAACTGGGCCTGAACTGAAGCAGTCGTGCCGCCTGCT
GCGCGGCACCAAGGCCCTGACCGAGGTGATCCCCCTGACCGAGGAGCTGGCCCAGGTGCAAGGCCCAGTCGCACGGCG
TGTACTACGACCCCTCCAAGGACCTGATCGCCGAGGATCTACCAGGAGATCTACCAGGAGTTCCTTCAAGAACCTGAAG
ACCGGCAAGTACGCCCGCATGCGCGGCGCCCACACCAACGACGTGAAGCAGCAGATCAAGAACGACTCGATCGTGGGG
CAAGGACCCCCAGTTCCGCCTGCCCATCCTGAAGGAGGACCTGGTGACAAGCTGGACCAGTACTGCGACCTCCAACCGCGAGACCAAG
ACACCCCCCTGGTGAACGCTGTGTGGACGAGGGCCGCCAGCAGGCCCATCGCGCGGCCATCCGAGCTGGCCGAGTCCAAAC
AAGGGCAAGGCCGCCTACGTGACCGACCGGCGCCCCAGGAAGGCCGAGCTCCAGCTGGTGA
CCTGCAGGAGGACTCCGGCTCCGAGGTGAACATCGTGACCGACTCCCAGTACGCCCTGGGCATCATCGAGAGTCCGAGCTGGTGA
ACCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCCCACAAGGGCATCGGCGGCAACGAAGCTGGTG
TCCGCCGGCATCCGGCCAAGATCCTGTTCCTGGACGGCATCGACAAGGCCCAGGAGGAGCACGAGAAGTACCACAGCAACTGGCGCGCCATGGCCAGTGAAGCCTTCCGACTT
CAACCTGCCCCCGTGGTGGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCAGGTGGACTGCTCCCCCGGCA
TCTGGCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCATGTGGCCAGCGGCTACATCGAAGCCGAGGTCATTCCCGCCGAGACCGGCCAGGAGACC
GGCCAGGAGACCGCCTACTTCATCCTGAAGCTGGCCGGCCGCTGGCCGGTGAAGACCGTGCATCGAGGCAGGCCAGGAGTTCCTGAACACCGCCGTGAAGGCCGCTGAGAAGA
GGCCGGCCTGTGGTGGGGCCGGCCAGCATCCCCAGCCAGAGTTCGGCATCCCCTACAACCCCCAGTCCCAGGGCGTGGTGGAGAGTCCATGACGCAAGGCGGCATCGGCCTAC
TCCGCCGGCGAGAGCCGCATCATCGACGATCATCCACCAGACCAAGGAGCTGCAGAAGCAGATCATCAAGATCCAGAACTTCCGCGTGTACTACCG
CGACTCCCGCGACCCGTGTGGAAGGGCCCGAGAGGGCGAGGGCGAGGGCCCAAGAGCCGGCCAAGCAAGTCAAGGTGTGCCCCC
GCCGCCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGACGACTGCGTGGCCGGCCGCCAGGACGAGGACTAA
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Fig. 127A

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84. 2003_CON_14_BG_pol.PEP
FRENLAFQQGEAREFSPEQARANSPTRRELWVRRGDSPLPEARAEGKGDIPLSLPQITLWQRPLVTVRIGGQLIEALLDTGADDTVLEDIN
LPGKWKPKMIGGIGGFIKVRQYDQILLEICGKKAIGTVLVGPTPINIIGRNMLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEK
IKALTDICTEMEREGKISKIGPENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPSGLKKKKSVTVLDVGDAYFSVPLDE
SFRKYTAFTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRIKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELRKHLLSWGF
TTPDKKHQKEPPELWMGYELHPDKWTVQPIQLPDKESWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTAEAELELAEN
REILKEPVHGVYYEPSKELIAEVQKQGLDQWTYQIYQEPYKNLKTGKYAKRGSAHTNDVKQLTEVVQKIATESIVIWGKTPKFKLPIRKETW
EVWWTEYWQATWIPDWEFVNTPPLVKLWYRLETEPIAGAETYVDGAANRETKLGKAGYVTDKGKQKIITLTETTNQKAELQAIHIALQDSG
SEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAM
ASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKIIH
TDNGSNFTSAAVKAACWWANITQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIAS
DIQTKELQKQITKIQNFRVYFRDSRDPIWKGPAKLLWKGEGAVVIQDNNEIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDS
```

Fig. 127B

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2003_CON_14_BG pol.OPT
TTCTTCCGCGAGAACCTGGCCTTCCAGCAGGGCGAGGCCCGCGGAGTTCTCCCCGAGCAGGCCCGGCCCAACTCCCCACCCGCCGCGCCGAGCTGTGGGTGCG
CCGCGGCCGACTCCCCCCTGCCCGAGGGCCCGCGCCGAGGGCAAGGGCGGCGCCGAGGGCCAGCGCGCCCCCTGGTGCCAGCGCGCCCCCTGGTGACCG
TGCGGCGCATCGGCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGCTGGAGGACACCGTGCCGGCCAAGTGGAAGCCCAAGATG
ATCGGGCGGCATCGGCGGCTTCATCAAGGTGCGCCAGTACGACCAGATCCTGCTGGGCGAAGAGGCCATCGGCACCGTGCCCGTGGTGGGCCCCAC
CCCCATCAACATCATCGGCGCCAACATGCTGACCCAGATCGGCTGACCCCAGATTCCCCATCTTCCCCCATGTCGACCTGCCCGTGAAGCTGAAGCCCG
GCATGGACGGCCCCAAGGTGAAGCAGTGGCCCCTGACCGAGGAGATCAAGGCCCTGACCGAGATCTGCACCGAGATGGAGCGGGCGGCCAAGATCTCC
AAGATCGGCCCCGAGAACCCCTACACACACCCCATCTTCGCCATCAAGAAGAAGAAGAGTCCACCAAGTGGCGCAAGCTGGTGGACTTCCGCGAGCTGAACAA
GCGCACCCAGGACTTCTGGGAGGTGCAGCTGGGCATCCCCCACCCCTCCCGGCATCCCCCCTGAAGAAGAAGAAGTCCGTGACCGTGCTGGGCGACGCCTACT
TCTCCGTGCCCCTGGACGAGTTCCTTCCGCCAAGTACACACCCCTTCACCATCCCCTGGAGCCCTTCCACCAACGAGACCCCCGGCATCCGCTACCAGTACCAGTA
CCCCAGGGCTGGAAGGGCTCCCCCCGCCCATCTTCCAGTCCTCCATGACCAAGATCTGGAGGCACCCTGCGTCCCGGGCTTCCACCACCC
CATGGACGACGTGTACGTGGGCTCCGACCTGGAGATCGGCCAGCACCGCAAGATCGAGCTGCGCCAAGAGTGACCCGGCATCAAGGTGAAGCAGTGCTGCG
CCGACAAGAAGCACCAGAAGAGGAGCCCCCCCCTTCCTCTGTGGATGGGCTACGAGCTGCACCCCGACAAGTGGACCGTGCAAGCTGAACCTGCCCGGCATCAAGG
TCCTTGGACCGTGAACGACATCCAGAAGCTGGTGGGCCAAGCTGAACTGGGCCTCCAAGCTGAACGTGAAGGTGAAGCAGCTGTGTGCAAGCTGCTGCG
CGGCGCCAAGGCCCTGACCGACGTGATCCCCCTGACCGAGGAGCTGGGCGGCCGCTGGACCGGCCAAGAAGCTGTGGTCCCGAGGAGCTGAGCTGAACGACGTGAAGCTG
ACTACGAGCCCTCCAAGGAGCTGATCGCCAGACCGCTGGACTGGGCCTGCAGAAGAGGTGTGCAGCAGCCGCGAGATCCTGACCCGAGAACCTGAAGACC
GGCAAGTACGCCAAGGCCCAAGGCCGGCTCCCGCCCACCACAGGAGGAGGAGCAGCGTGAAGCAGCGGTGGTGCAGCAGCCGCGAGAGATCCTGACCCATCGTCGGTCGGGGGCAA
GACCCCCCCAAGTTCAAGCTGCCCATCCAAGATGGTGGTACCGCGCTGGGCGCGCCGAGTCCCGACCTGGACGTGCACCGAGTTCGTGTGAACA
CCCCCCCCCTGGTGAAGCTGTGGTGACCGTGGTGCTGACCGCGGCGCCCAGTCCCGCCCAGCTGCAGCCCAGATCTGGCGGCCACCGCGCCAAGCTG
GGCAAGGCCGGCTACGTGACCGACCGTGGTGAACATCGTGACCGACTCCCAGTACGCCGGGCATCCCCAGTGCCCCCGAGGTGGTGAACC
GCAGATCATCGAGCAGCTGATCAAGAAGGAGAAGGTGTACCTGTCCTGGGTGCCCGCGCACAAGGGCATCGGCGGCAACGAGCAGGTGGACAAGCTGGTGTCC
TCCGGCATCCGCAAGGTGCTGTTCCTGGACGGGGCATCGACGAGCATCAAGGCCCTGACCGAGGCCGTGCACTCCAACTGGCGCGCCACTCCAACTTCAA
CCTGCCCCCGTGGTGGTGGCCAAGGAGATCGTGGCCTCCTGCGACAAGTGCCAGCTGAAGGGCGAGGCCATGCACGGCCCAGGTGGACTGCTCCCCCCGGCATCT
GGCCAGCTGGACTGCACCCACCTGGAGGGCAAGATCATCCTGGTGGCCGTGCATGTGGCCAGCGTGTACATCGAGGCGCGCCTACAACCGACCGGC
CAGGAGAGACCGCCTACTTCATCCTGAAGCTGGCGGCCACCTGGAAGATCATCATCCCAGTCCCAGTGCCCCGAAAGCTTCCACCAGGGCTCCAACTTCACCTCCGACCGTGAAGGC
CGCCTGCTGGTGGGCGCCAACATCACCGAGGCCCAGCACTTCCGGCTCCGAGAGTTCGGCATCCCCTACAACCCCCAGTCCCCAGTTCATCGAGAAGGGGCTACTCC
GCCGCGGAGCCTGGTGGGCGCCATCATGGCCGCCATCCTGCTGGAAGGGGGCCCCAAGCTGCGTGTGGGGAAGGGGCGCGGCGGCATCCGCGGCGGCTACTCC
CTCCCCGCGCAAGATCATCCGCGACTACGGCAAGCAGGCCCAGATGGCCGCCGGGACGACGTGCTGGGCCGGCGCGGCCTGCTGAAGCAAGGTGGTGCCCCGCC
GCAAGGCCAAGATCATCCGCGACTACGGCAAGCAGATGGCCGGCGATGACGACTGCGTGCTGGGCCGGCGCGGCCTGCTGCGACGACGAGGACTAA
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